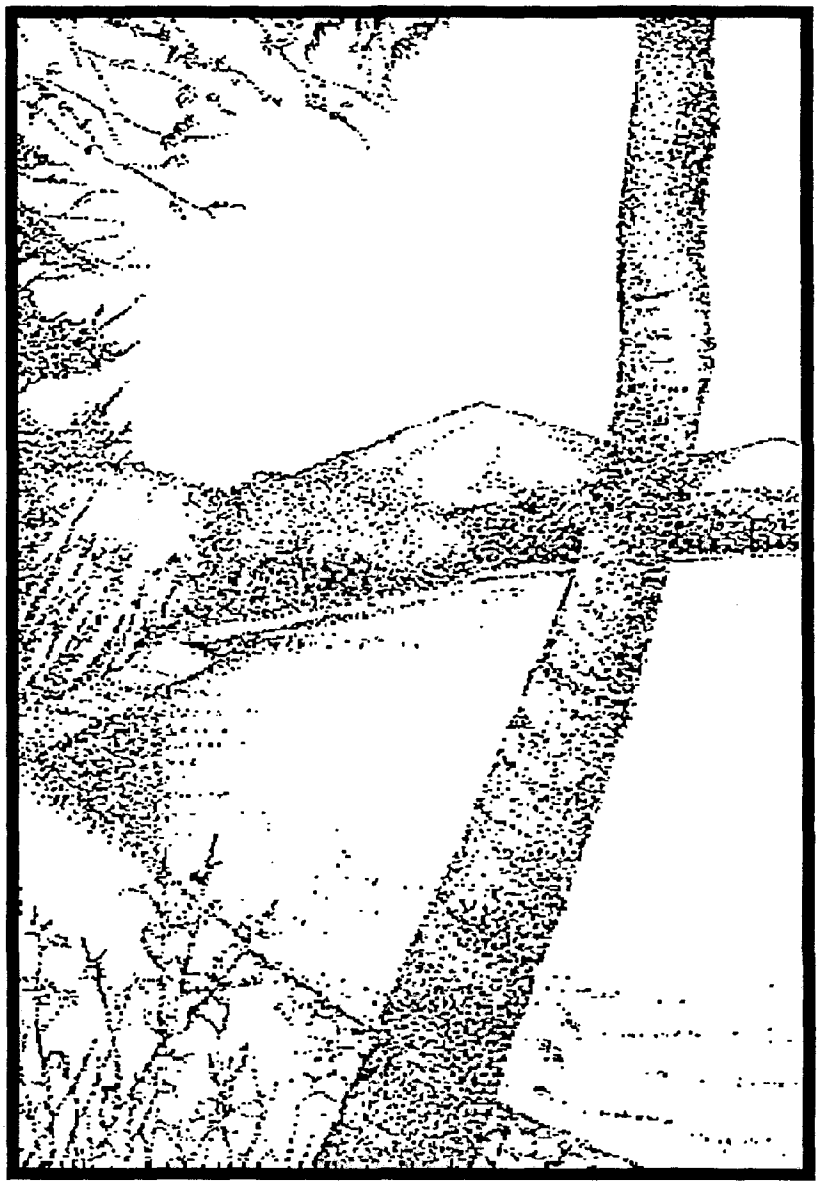
Town of Stratham



Water Resource Management and Protection Plan

Prepared by the Rockingham Planning Commission

WATER RESOURCE MANAGEMENT AND PROTECTION PLAN FOR THE TOWN OF STRATHAM, NEW HAMPSHIRE

Prepared for the Stratham Planning Board by:

The Rockingham Planning Commission

May 1993

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INTRODUCTION

This component of the Town of Stratham Master Plan addresses the requirements established by the New Hampshire Office of State Planning under the authority of RSA 4-C:20,I, for the preparation of local water resource management and protection plans.

The goals of this document are to:

Identify and evaluate the adequacy of existing and potential water supply sources to meet the current and future needs of the community;

Identify existing and potential threats to surface and groundwater resources;

Evaluate existing local programs, policies and regulations as they relate to water resources; and

Identify regulatory and non-regulatory programs that would benefit the Town in its water resource management and protection efforts.

The protection and wise use of water resources are of critical concern to the Town of Stratham. With the majority of Town residents dependent on groundwater from private wells and public water systems, the quantity and quality of this resource must be protected from excessive depletion and contamination.

In general, there is a direct relationship between land use and water quality. Locating hazardous land uses in areas with poor soil suitability can degrade and contaminate both surface and groundwater resources, increase flood hazards, destroy water-based wildlife and interfere with scenic and recreational values. It is the Town's responsibility to take reasonable precautions to protect all water resources from incompatible uses and, in so doing, protect the health and general welfare of the community.

DESCRIPTION OF SURFACE WATER RESOURCES

Regarding the source information (both data and maps) used to describe and map the surface water resources of Stratham, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers the source information to be the best available information existing at this time.

Surface water systems are any type of water resource located above ground on the earth's surface. Examples of surface water systems include: streams, rivers, marshes, ponds, bogs, lakes, wetlands, etc. Surface water systems are more dynamic than groundwater, in that they are influenced by the effects of wind, rain, and temperature. They are also subject to varying rates of flow, such as the difference between the flow rate of a river as opposed to that of a pond.

Surface water resources function as holding areas for flood waters and seasonal high waters. In addition, they serve as recharge areas and discharge points for groundwater resources. The point of discharge is where the surface water and groundwater are hydrologically connected. Most commonly, surface water resources will act as a discharge point for groundwater. Such a discharge can replenish shallow domestic water wells during the drier summer months, however, prolonged dry periods can result in an overall lowering of the water table.

Watersheds

The watershed is the principal focus in describing a surface water system. It is the land area within a series of connecting higher ridges that drain surface water to the lowest point, which is where a stream or river flows out of the watershed. The network formed by rivers, streams, lakes, and ponds is known as the drainage system of the watershed. The watersheds in Stratham will be examined according to:

Perennial streams and waterbodies;

Legislative classification of surface water quality;

The location and extent of wetlands and floodplains; and

The withdrawals and discharges of major surface water users.

Watersheds Within Stratham

Stratham forms a portion of three regional watersheds: the Great Bay, the tidal Squamscott River, and the Coastal Watershed. The first two watersheds are part of the larger Piscataqua River Basin, while the Coastal Watershed is part of the larger Coastal River Basin. The accompanying Map 1 (Regional Watershed Map) depicts Stratham's location within the three regional watersheds.

In an effort to isolate meaningful drainage patterns, two sub-watersheds were identified within the Town's drainage system. The first is the Dearborn Brook Sub-Watershed which forms a portion of the Squamscott River Watershed, and the second is the Winnicut River Sub-Watershed which forms a portion of the Great Bay Watershed. Map 2 (Watersheds and Surface Waters Map) depicts the watershed divides within Stratham (both regional and sub-watersheds), plus the Town's perennial waterbodies and watercourses.

There are eight significant waterbodies within Stratham: Mill Pond, the Winnicut Mill Pond, and six ponds which do not have names. The unnamed ponds are depicted on Map 2 as Ponds #1 through #6. In addition, there are a number of tiny ponds (one acre or less) scattered throughout Town. The vital statistics of Stratham's significant waterbodies (including surface area, elevation, watershed location, and whether freeflowing or impounded) are presented in Table 1 below.

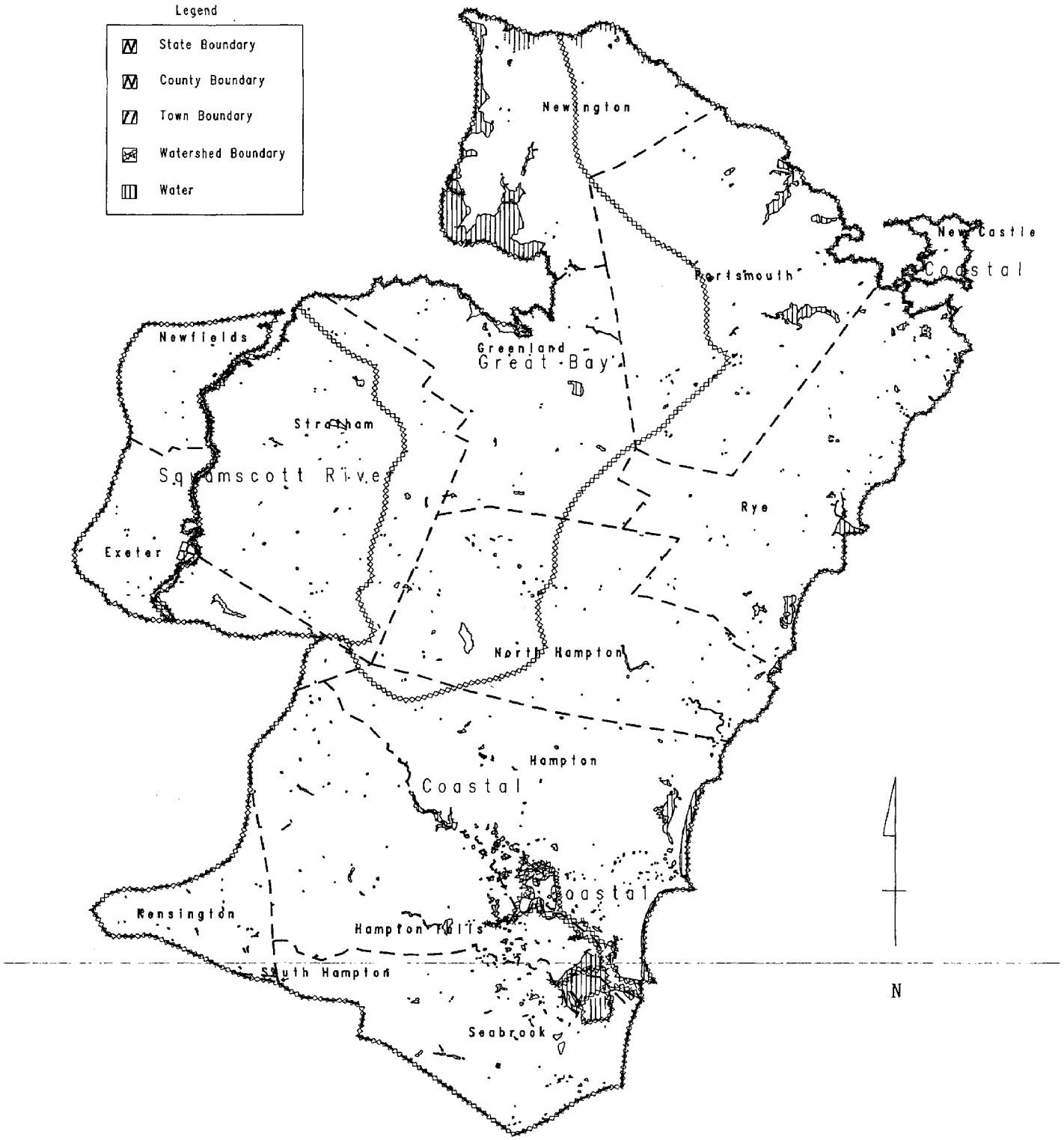
TABLE 1 - STRATHAM WATERBODIES

Waterbody	Surface Area (acres)	Elevation (feet)	Watershed Location	Impounded or Freeflowing
Mill Pond	3.0	30	Squamscott River	Impounded
Winnicut Mill Pond	3.0	40	Great Bay	Impounded
Unnamed Pond #1	3.0	75	Great Bay	Impounded
Unnamed Pond #2	2.0	40	Great Bay	Freeflowing
Unnamed Pond #3	12.0	150	Squamscott River	Freeflowing
Unnamed Pond #4	6.0	150	Squamscott River	Freeflowing
Unnamed Pond #5	3.0	150	Squamscott River	Freeflowing
Unnamed Pond #6	2.0	45	Squamscott River	Freeflowing

Sources: USGS topographic maps, WRD dam records, and RPC analysis.

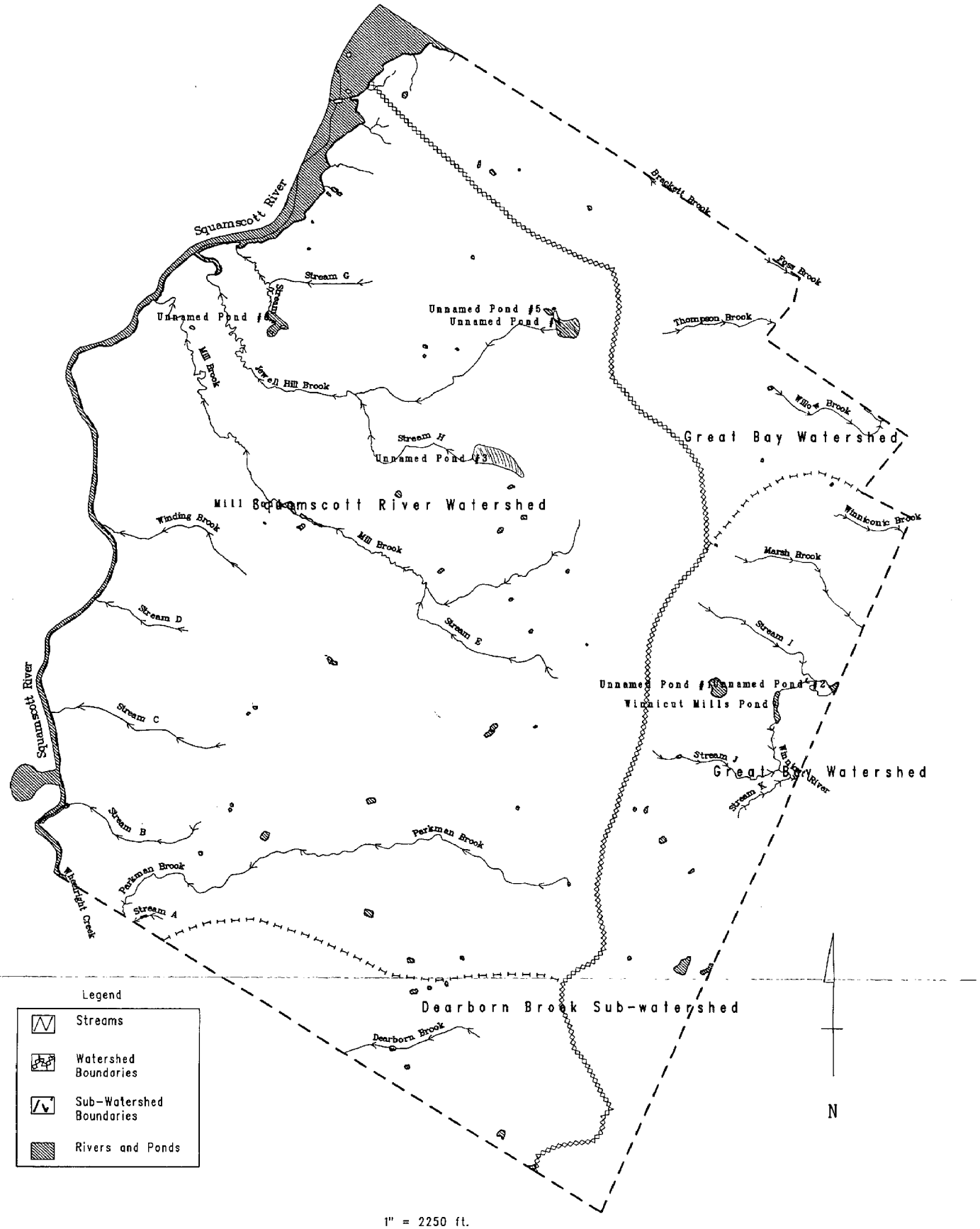
Town of Stratham - Regional Watersheds

MAP 1



Town of Stratham - Watersheds and Surface Waters

MAP 2



Prepared by the
Rockingham Planning Commission
June 1, 1993 DRA

In terms of perennial streams, Stratham contains 14 named streams and 11 unnamed streams for a total of 25 watercourses. The Town's watercourses are shown on Map 2. The unnamed streams are shown on the map as Unnamed Streams A through K. The vital statistics of the Town's perennial streams are presented in Table 2 below.

TABLE 2 - STRATHAM WATERCOURSES

Waterbody	Length (miles)	Elevation (feet)	Watershed Location	Impounded or Freeflowing
Squamscott River	5.2	10	Squamscott River	Freeflowing
Winnicut River	1.0	70	Winnicut River	Impounded
Foss Brook	0.2	70	Great Bay	Freeflowing
Jewell Hill Brook	2.2	150	Squamscott River	Freeflowing
Wheelright Creek	0.1	10	Squamscott River	Freeflowing
Mill Brook	3.6	130	Squamscott River	Impounded
Parkman Brook	2.2	90	Squamscott River	Freeflowing
Dearborn Brook	0.5	90	Dearborn Brook	Impounded
Winding Brook	0.9	80	Squamscott River	Impounded
Thompson Brook	0.6	160	Winnicut River	Freeflowing
Willow Brook	0.7	90	Winnicut River	Freeflowing
Winniconic Brook	0.4	35	Winnicut River	Freeflowing
Marsh Brook	0.8	60	Winnicut River	Freeflowing
Brackett Brook	0.1	90	Great Bay	Freeflowing
Stream A	0.3	50	Squamscott River	Freeflowing
Stream B	0.9	60	Squamscott River	Freeflowing
Stream C	0.9	40	Squamscott River	Freeflowing
Stream D	0.5	40	Squamscott River	Freeflowing
Stream E	1.0	70	Squamscott River	Freeflowing
Stream F	0.5	20	Squamscott River	Freeflowing
Stream G	0.5	40	Squamscott River	Freeflowing
Stream H	1.1	150	Squamscott River	Freeflowing
Stream I	0.8	75	Winnicut River	Freeflowing
Stream J	0.7	55	Winnicut River	Freeflowing
Stream K	0.6	70	Winnicut River	Freeflowing

Sources: USGS topographic maps, WRD dam records, and RPC analysis.

The drainage characteristics of the Town's regional watersheds and sub-watersheds are described in the following paragraphs. Information is provided regarding the watershed's total acreage, acreage within Stratham, perennial waterbodies, perennial watercourses, and other communities within the watershed.

Regional Watersheds

1. Great Bay Watershed: The Great Bay Watershed is approximately 117 square miles in size, covering portions of twelve communities: Stratham, Greenland, Hampton, Newington, North Hampton, Portsmouth, Newmarket, Durham, Lee, Madbury, Dover and Barrington. Stratham's portion of the watershed consists of roughly 2,760 acres. As mentioned previously, the Winnicut River Sub-Watershed forms a portion of the Great Bay Watershed within Stratham. Thus, the previously cited acreage total includes the land within the Winnicut River Sub-Watershed.

The Great Bay Watershed's drainage system is formed by the convergence of seven major rivers: Salmon Falls, Cocheco, Bellamy, Oyster, Lamprey, Squamscott and Winnicut. Within the watershed is the Great Bay estuary. The estuary is approximately 17 square miles in size and is considered to be one of the largest and most productive estuaries along the east coast. Within the watershed, the perennial streams drain in an easterly direction until converging with the Winnicut River which flows in a northerly direction into the Great Bay. Significant watercourses within the watershed include: the Winnicut River, Foss Brook, Thompson Brook, Willow Brook, Brackett Brook, Winniconic Brook, Marsh Brook and Streams I, J and K. Significant waterbodies within the watershed include: Winnicut Mills Pond and Unnamed Ponds #1 and #2.

2. Squamscott River Watershed: This watershed is roughly 19 square miles in size, covering portions of Stratham, Exeter, Newfields and Newmarket. Stratham's portion of the watershed consists of approximately 6,300 acres. As mentioned above, the Dearborn Brook Sub-Watershed forms a portion of the Squamscott River Watershed within Stratham. Thus, the previously cited acreage total includes the land within the Dearborn Brook Sub-Watershed.

   Within Stratham's portion of the watershed, streams flow in a westerly direction, emptying into the tidal Squamscott River which eventually empties into Great Bay. Significant watercourses within the watershed include: the Squamscott River, Wheelwright Creek, Dearborn Brook, Parkman Brook, Winding Brook, Mill Brook, Jewell Hill Brook, and Streams A through H. Significant waterbodies: the Mill Pond, and Unnamed Ponds #3 through #6.

3. Coastal Watershed: The receiving waters of this watershed are the Piscataqua River and the Atlantic Ocean. The watershed consists of approximately 74 square miles in portions of the following communities: Stratham, Greenland, Hampton, Kensington, Newington, North Hampton, Portsmouth, Rye, Seabrook and Exeter. Stratham's portion of the watershed consists of 92 acres. There are no significant watercourses or waterbodies within Stratham's portion of the watershed.

Sub-Watersheds

1. Winnicut River Sub-Watershed: This sub-watershed covers roughly half of the larger Great Bay Watershed. Stratham's portion of the sub-watershed consists of roughly 2,070 acres. Stratham shares this sub-watershed with Hampton, North Hampton and Greenland. As mentioned above, the streams in this area flow in an easterly direction until merging with the Winnicut River, which flows north into the Great Bay. Significant streams in this vicinity include: the Winnicut River, Thompson Brook, Willow Brook, Winniconic Brook, Marsh Brook and Streams I, J and K. Significant waterbodies include: Winnicut Mills Pond and Unnamed Ponds #1 and #2.

2. Dearborn Brook Sub-Watershed: This sub-watershed encompasses approximately 776 acres within the Squamscott River Watershed, with Stratham's portion consisting of roughly 510 acres. The sub-watershed is shared between Stratham and Exeter. This is a particularly sensitive area, since Dearborn Brook feeds the Exeter Reservoir which is used to augment Exeter's municipal water supply. Dearborn Brook flows in a northwesterly direction into the Exeter Reservoir. Other than Dearborn Brook and Wheelwright Creek, there are no significant waterbodies or watercourses within this sub-watershed.

Stratham Surface Water Quality

In New Hampshire, each surface waterbody and watercourse has been given a legislative water quality classification of A, B, or C, as identified in RSA 149:3. The classifications are defined below.

Class A Waters - Of the highest quality and potentially acceptable as public water supply sources after disinfection. No sewage or wastes shall be discharged into these waters.

Class B Waters - Of the second highest quality and no objectionable physical characteristics. No sewage or waste shall be discharged into these waters unless they have been adequately treated. Acceptable for bathing and other recreational purposes and, after treatment, for use as public water supplies.

Class C Waters - Acceptable for boating, fishing, or for industrial water supply, either with or without treatment. These waters cannot be used as a public water supply source.

Currently, all of Stratham's surface water resources have received Class B status from the New Hampshire State legislature. The only exception is the Dearborn Brook Sub-Watershed which is considered a Class A water source due to the use of the Exeter Reservoir as a municipal water supply source for Exeter.

Although Stratham does not actively monitor the quality of its surface waters, there are several organizations involved in monitoring the Squamscott River and its tributaries. These organizations and their efforts are described below.

1. Municipal Monitoring: The Exeter Public Works Department conducts daily water quality monitoring efforts at the municipal wastewater treatment plant's point of discharge along the Squamscott River. The Department also conducts toxicity tests on a quarterly basis. As mentioned previously, the Squamscott River is a tributary to the Great Bay. All of the bay's tributaries are currently closed to shellfish harvesting because of the problems associated with improperly treated or untreated sewage. Exeter has recently upgraded its sewer system and treatment plant to separate stormwater from wastewater. Prior to the project's completion, storm events would often overflow the Town's sewage lagoons, thus resulting in untreated sewage being discharged into the river. It is expected that the stormwater separation project will eventually enhance the river's water quality as well as the bay's.

2. 305(b) Water Quality Report: A comprehensive source of regional water quality information can be found in the 1988 publication NH Water Quality Report to Congress 305 (b), prepared by the Water Supply and Pollution Control Division of the NH Department of Environmental Services. The report describes broad water quality parameters for the major river basins in the State, including the Piscataqua and Coastal basins. The report identifies surface waters which do not meet the standards for their legislative classification. Within Stratham, only the Squamscott River was designated as "not supporting" its Class B rating.

3. Great Bay National Estuarine Research Reserve: The entirety of the Squamscott River falls within the Great Bay National Estuarine Research Reserve which was designated by the United States Congress in 1989 as the nation's 18th National Estuarine Research Reserve under the federal Coastal Zone Management Act (CZMA). The CZMA created a federal-state partnership for the protection and management of coastal areas. New Hampshire's Coastal Program is administered by the NH Office of State Planning.

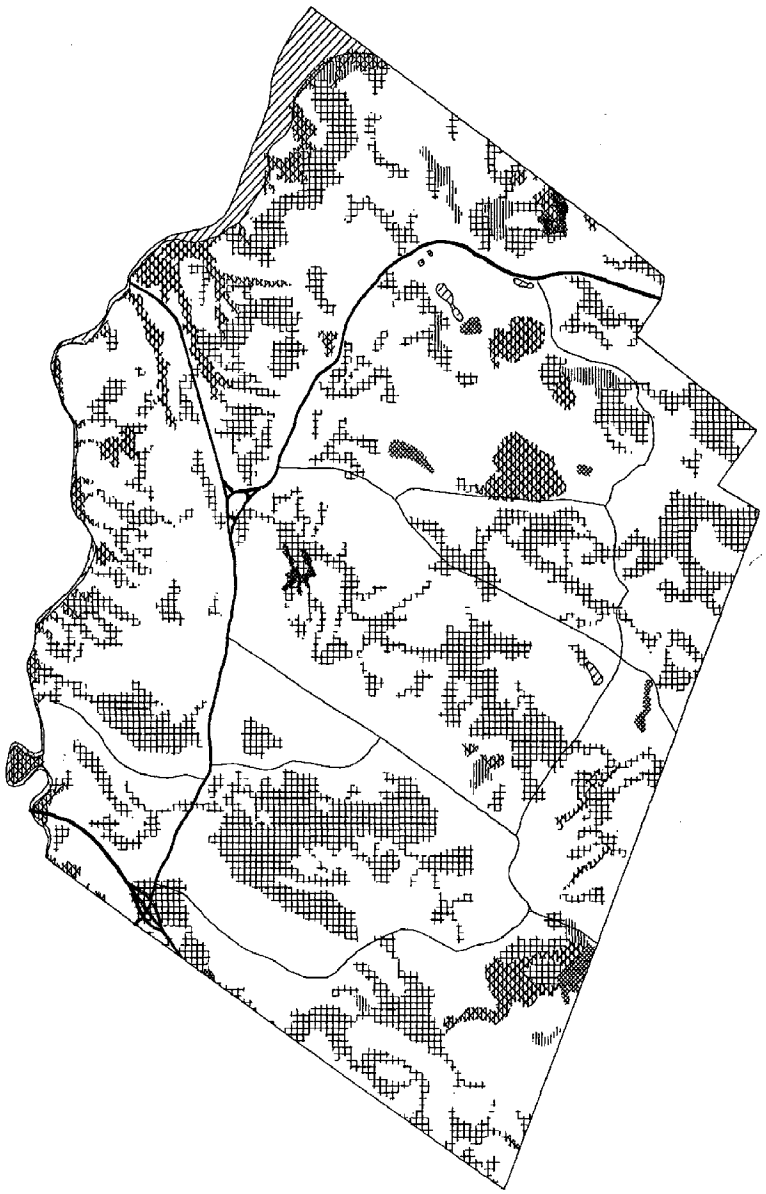
   The Great Bay Reserve includes over 4,400 acres of tidal water areas representing the range of different environments around the estuary (saltmarsh areas, bluffs, rocky shores, woodlands, open fields, etc.). While the highest priority of the Reserve is to preserve the bay through an aggressive land acquisition program, there is also a strong emphasis on using the reserve for long-term research and education.

4. Great Bay Hydrologic Unit: This is a project sponsored by the US Department of Agriculture, and involves the following organizations: The Rockingham and Strafford County Conservation Districts, the Rockingham and Strafford County branches of the Soil Conservation Service (SCS), the Agricultural Conservation and Stabilization Services (ASCS), the UNH Cooperative Extension Service and the US Geological Survey. The project provides non-point pollution source education to the public for the watershed area covering the Great Bay. The education effort is geared towards providing best management education materials for potentially hazardous land uses.

Wetlands

Stratham's Zoning Ordinance defines the Town's Wetlands Conservation District as follows: "Those areas of the Town that contain marshes, ponds, bogs, lakes, as well as soils that are defined as poorly or very poorly drained as defined by the National Cooperative Soil Survey conducted by the USDA Soil Conservation Service." The district also includes "the borders of tidal marshes of the Squamscott River and Great Bay. Said borders are hereby defined as those areas adjacent to the Squamscott River and Great Bay with elevations of eight (8) feet or less above mean sea level." The Town's Subdivision Regulations and Site Plan Review Regulations further refine the district to include those areas consisting of poorly drained and very poorly drained soils as defined through the use High Intensity Soil Surveys (HISS).

The Town's Wetland Map is included in this document as Map 3. The map comes from the soon to be published Soil Survey of Rockingham County, New Hampshire. The map was created by digitizing the County soil survey sheets onto the Rockingham Planning Commission's Geographic Information System (GIS). The document, Soil Potentials for Development: New Hampshire Seacoast Area, prepared by the Rockingham and Strafford County Conservation Districts in 1985, was used to evaluate Stratham's soils. Along with identifying soil properties found within the two counties, this publication rates soils in terms of three development categories: soil suitability for on-site septic systems, dwellings with basements, and road construction. The ratings for these three soil categories were then combined to form an overall development rating for every soil property identified in both counties. The rating matrix used in the above publication is presented in this document as Appendix A, along with a brief description of all the soils found within Stratham.



Town of Stratham
Wetlands
MAP 3

Water

Poorly Drained

Very Poorly Drained
- Muck
- Peat
- Ponded
- Other Very Poorly Drained

0 3500 7000 10500

Scale in Feet

Sources: "Soils Potential for Development-Rockingham County"; U.S.D.A.-Soil Conservation Service and Rockingham County Conservation Dist.; May 1987.

Rockingham County, N.H. Soils Map; U.S.D.A.-Soil Conservation Service. March 1980
Preliminary Data - Subject to Change.

Prepared by the Rockingham Planning Commission, May 1989 SRG

The amount of wetland soils within Stratham was calculated from the Town's Wetlands Map (Map 3) by Commission personnel using a planimeter. Wetland soils were broken down by the number of acres of poorly drained soils and very poorly drained soils. Table 3 below shows the number of acres of wetland soils within the three regional watersheds. The wetland acreage within the two sub-watersheds are included as part of the regional watershed wetland totals. The table indicates that Stratham contains roughly 3,342 acres of wetlands. This accounts for roughly 36% of the Town's total land area.

TABLE 3

STRATHAM WETLAND SOILS

Watershed	Acres of Very Poorly Drained Soils	Acres of Poorly Drained Soils	Total Wetland Soils (Acres)
Great Bay Watershed	299	893	1,192
Squamscott River Watershed	485	1,615	2,100
Coastal Watershed	0	50	50
Total Acres of Wetlands:	784	2,558	3,342

Floodplains

A Flood Hazard Boundary Map was prepared for Stratham by the Federal Insurance Administration in 1975, and a more detailed Flood Insurance Rate Map (FIRM) was prepared by the Federal Emergency Management Agency (FEMA) in 1989. The preparation of these maps, plus the adoption of a special ordinance dealing with floodplain development, enables a town to participate in the National Flood Insurance Program (NFIP). The NFIP allows residents living in flood hazard areas to purchase flood insurance at low cost; however, insurance is only made available to communities which participate in the program. Stratham officially entered the NFIP program in 1989 when the Town adopted its Floodplain Management District. As of this date, Stratham is a member of good standing in the NFIP.

A small-scale version of the Stratham Flood Insurance Rate Map is included here as Map 4 (Flood Hazards and Bedrock Geology). The portion of Stratham falling within the 100-year flood zone was calculated by Commission personnel using a planimeter. Table 4 below indicates the acres of flood hazard areas within Stratham, broken down by regional watersheds. The flood hazard areas within the two sub-watersheds are included as part of the regional watershed flood hazard area totals.

TABLE 4

STRATHAM FLOOD HAZARD AREAS

Watershed	Acres Within the Flood Hazard Areas
Great Bay Watershed	115
Squamscott River Watershed	394
Coastal Watershed	0
Total Acres of Flood Hazard Areas:	509

Withdrawal and Discharge Information

In accordance with the NH Code of Administrative Rules (Wr 700), the Water Resources Division (WRD) of the NH Department of Environmental Services (DES) compiles data on all water users throughout the State which withdraw or discharge more than 20,000 gallons of surface water per day. According to the latest records of the WRD, there are no major surface water withdrawals or discharges taking place within Stratham.

However, there are three discharges taking place outside of Stratham which impact on the Town's surface waters. These discharges include: the Exeter and Newfields municipal wastewater treatment plants which discharge to the Squamscott River, and the Newmarket wastewater treatment plant which discharges to the Lamprey River. Although the Lamprey River is not located within Stratham, it is part of the Great Bay estuarine system. Tidal waters from this system flow into Stratham during periods of high tide.

Potential Surface Water Supplies

With two exceptions, all of the Town's surface water resources currently maintain a Class B water quality status as defined by the State Legislature. The first exception is the Class A Dearborn Brook Sub-Watershed. As mentioned previously, Dearborn Brook is used to augment the Exeter municipal water system. The second exception is the tidal Squamscott River. According to the previously cited NH Water Quality Report to Congress 305 (b), prepared by the Water Supply and Pollution Control Division of the NH Department of Environmental Services in 1989, the Squamscott River does not support its Class B rating.

Stratham does not use any portion of its surface water resources to meet the community's water supply demands, and there are no plans to utilize these resources for such a purpose within the planning period (approximately ten years). The only surface water resource in Stratham which has the requisite water delivery capability is the Squamscott River. However, it is highly unlikely that any community would use the Squamscott River as a water supply source, due to the tidal nature of the river and its existing water quality problems. The remaining streams and rivers within Stratham have relatively small flows and it would not make economic sense to incur the costs of treatment which would be required in order to use these resources as public drinking water supplies.

Stratham's water supply demands are currently met by the Town's groundwater resources. In the future, if a need is demonstrated for a municipal water supply or additional public water supplies, the Town's groundwater resources would, in all probability, be the preferred option. These resources are described in the next section.

MAP 4

FLOOD HAZARDS AND GEOLOGY

Prepared by the Rockingham Planning Commission
June 1989

Sources:

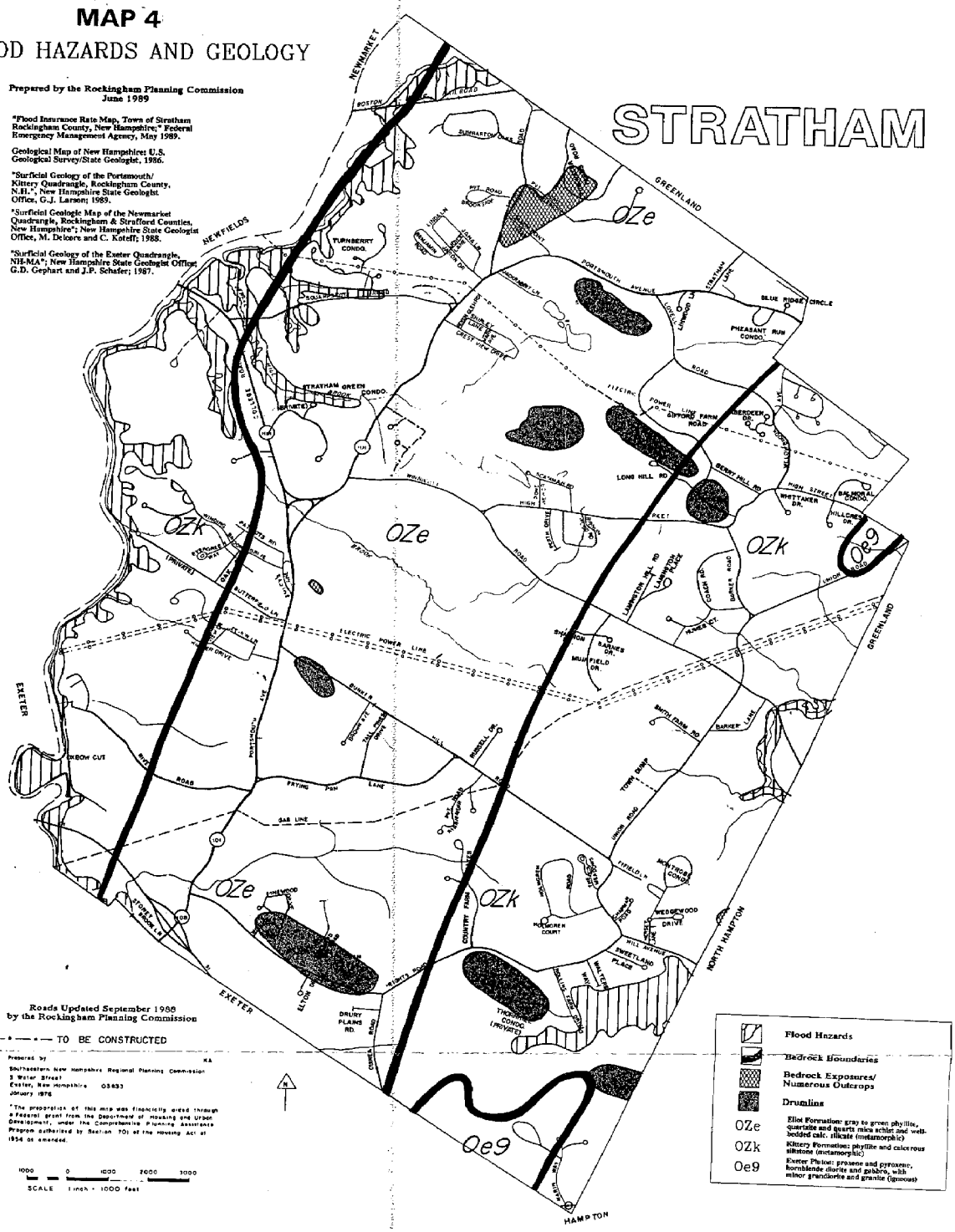
"Flood Insurance Rate Map, Town of Stratham Rockingham County, New Hampshire;" Federal Emergency Management Agency, May 1989.

Geological Map of New Hampshire; U.S. Geological Survey/State Geologist, 1986.

"Surficial Geology of the Portsmouth/ Kittery Quadrangle, Rockingham County, N.H.."; New Hampshire State Geologist Office, G.J. Larson; 1989.

"Surficial Geologic Map of the Newmarket Quadrangle, Rockingham & Strafford Counties, New Hampshire"; New Hampshire State Geologist Office, M. Deloare and C. Koteff; 1988.

"Surficial Geology of the Exeter Quadrangle, NH-MA"; New Hampshire State Geologist Office G.D. Gephart and J.P. Schafer; 1987.



Roads Updated September 1988
by the Rockingham Planning Commission

— a — a — TO BE CONSTRUCTED

Prepared by KA
Southeastern New Hampshire Regional Planning Commission
3 Water Street
Exeter, New Hampshire 03833
January 1976

*The preparation of this map was financially aided through a Federal grant from the Department of Housing and Urban Development, under the Comprehensive Planning Assistance Program authorized by Section 701 of the Housing Act of 1954 as amended.

1000 0 1000 2000 3000
SCALE 1 inch = 1000 feet

	Flood Hazards
	Bedrock Boundaries
	Bedrock Exposures/ Numerous Outcrops
	Drumlins
OZe	Eliot Formation: gray to green phyllite, quartzite and quartz mica schist and well-bedded calc. silicate (metamorphic)
OZk	Kittery Formation: phyllite and calcerous siltstone (metamorphic)
Oe9	Exeter Pluton: pyroxene and pyroxene, hornblende diorite and gabbro, with minor granodiorite and granite (igneous)

DESCRIPTION OF GROUNDWATER RESOURCES

Regarding the source information (both data and maps) used to describe and map the groundwater resources of Stratham, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers the source information used in this section to be the best available information existing at this time.

Groundwater Resources

Groundwater is a concentration of subsurface water, occurring in saturated soils and geological formations. It is resupplied through precipitation and surface water discharge. The water infiltrates the ground through an aerated zone where impurities are filtered out. The water then moves to a saturated zone where the pore spaces between soil particles are filled by the water. It is very important that the earth's surface be able to transmit water so that a certain percentage can be stored underground as "groundwater". If excessive compaction or extensive covering of the earth's surface occurs, the amount of water that can reach the saturated zone and become groundwater is reduced.

Aquifers are found where land surfaces are permeable and the storage and transmission of water can take place. Aquifers having medium to high potential to yield groundwater occur in the New Hampshire seacoast area as alluvial deposits of sand and gravel (unconsolidated deposits) or in bedrock fractures (consolidated deposits). The major source of aquifer recharge in the seacoast region is through precipitation directly onto the aquifer's surface. In terms of the hydrologic cycle, approximately one-half of the average annual precipitation in the seacoast area is returned to the atmosphere as evapo-transpiration. The other half is split between surface water discharge and groundwater storage.

The unconsolidated deposits, also called stratified drift deposits, contain sorted layers of gravel, sand, silt and clay. They are found primarily along valley bottoms. These materials have abundant pore space to store water, in fact, the pore space can account for more than 30% of the deposit's total volume. Consequently, these stratified drift deposits of sand and gravel have become good sources of medium to high volume aquifers.

Bedrock fractures normally do not yield the same quantity of groundwater that stratified drift deposits do; however, they cannot be overlooked in terms of contributing to a community's water supply needs. Bedrock fractures are more productive when they have a layer of sand and gravel over them. This allows recharge to occur directly from above. Bedrock fractures are usually adequate for low density domestic wells. In contrast, till aquifers usually have a lower yield, and therefore, are seldom used for water supplies. This is due to the compact nature of the deposit which is typically composed of a mixture of clay, silt, gravel and boulders. The transmission and storage of water is greatly reduced in this type of aquifer.

The most common types of aquifers occur in two conditions, confined and unconfined. Confined aquifers have a layer of impermeable material over them, such as clay. Unconfined aquifers have a layer of permeable material above, thus permitting direct recharge from the surface. The water table (the top of the saturated zone) fluctuates, depending on the recharge rate to this zone. The confined system is under pressure due to the surface layer of clay on top and is resupplied where this layer is interrupted or terminates. See Figures 1 and 2 on the following page.

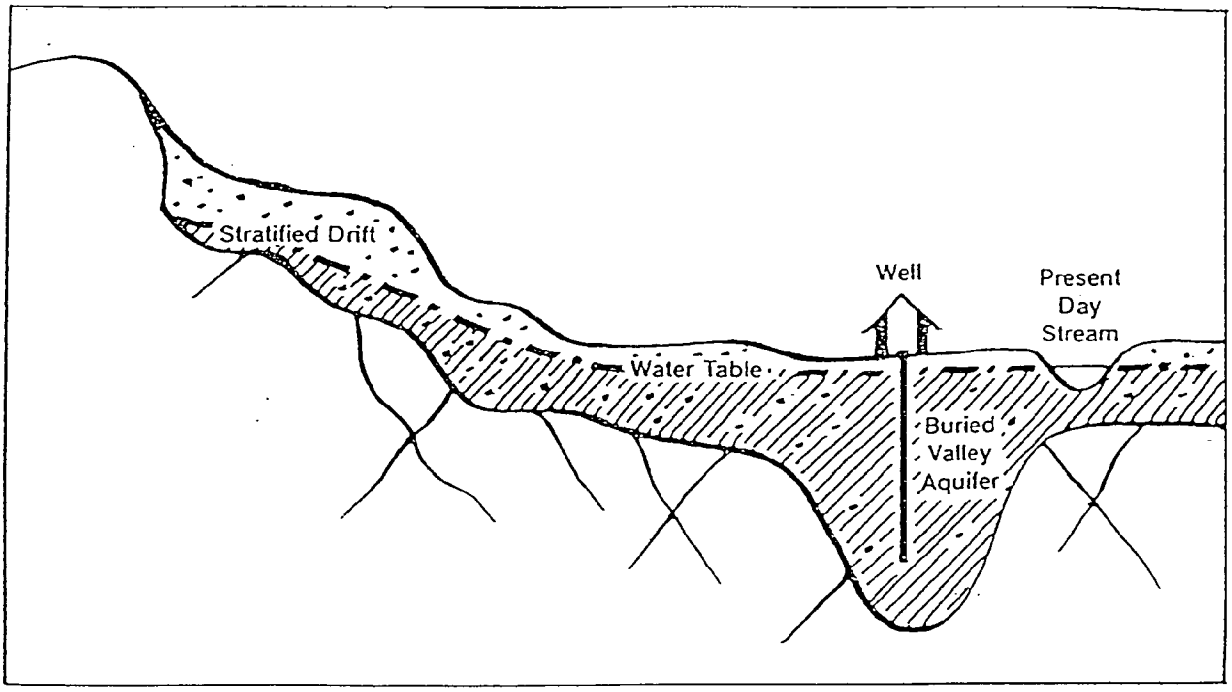
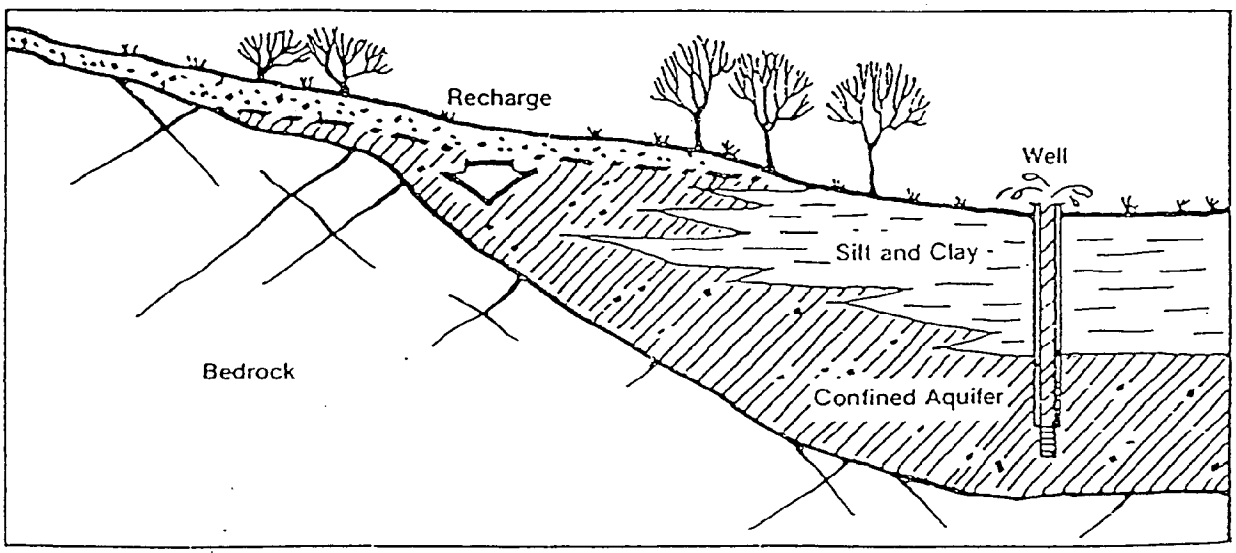


FIGURE 1 UNCONFINED AQUIFER



Confined aquifers are located between layers of material that have very low permeability. Groundwater in these aquifers is under pressure.

FIGURE 2 CONFINED AQUIFER

Stratified Drift Aquifers

The groundwater resources of Stratham have been investigated by the NH State Geologist Office, the US Army Corps of Engineers (USACE) and the US Geologic Survey (USGS). The various investigatory efforts are described in chronological order below.

1. US Geological Survey (USGS): In 1977, the USGS identified several medium yield and low yield aquifers underlying the Town's major rivers and wetland areas. According to the 1977 study, wells located within medium yield aquifers "may yield sufficient quantities of water for small municipal and rural water districts and commercial and light industrial use". The study indicates low yield aquifers are suitable for individual water wells, but not for larger water systems. (source: Availability of Groundwater in the Lower Merrimack River Basin, Southern New Hampshire, USGS, 1977).

2. US Army Corps of Engineers (USACE): In 1980, the USACE identified the existence of an aquifer in Stratham's southeast corner, at the end of Bunker Hill Road. The aquifer lies wholly within Stratham and receives recharge from precipitation only. The study describes the aquifer as "a Kame plain surrounded by Marine deposits." Although the study noted large amounts of clay in the northwestern portion of the aquifer, it was estimated that the aquifer could deliver roughly 153,000 gallons per day. The study did not make any final recommendations as to the suitability of the aquifer as a potential supply source for a public or municipal water system. (Source: Groundwater Assessment Study for 50 Communities in Southeastern New Hampshire, USACE; September, 1980).

3. US Army Corps of Engineers (USACE): In 1982, the USACE made an assessment of the aquifer identified in the 1980 study cited above. The 1982 study estimated that 70% of Stratham's population would be served by a municipal water system by the year 2030. The estimate of the aquifer's water delivery capability was upgraded to 360,000 gallons per day, which was deemed sufficient for a municipal water system. (Source: Southern New Hampshire Water Resource Study, USACE; August, 1982).

4. NH State Geologist Office: By early 1989, the NH State Geologist Office finalized its surficial geology map for the Stratham area. This map identified stratified drift formations as "glacial and post-glacial water-laid deposits" and "stratified glacial sand and gravel". This mapping effort provides a reasonable delineation of the Town's stratified drift aquifers. However, because surficial geology is based on the earth material at depths ranging from five to ten feet, it is entirely possible for an aquifer formation to have a greater or lesser lateral extent at greater depths than depicted by this mapping effort. This appears to be true for Stratham's stratified drift deposits.

5. US Geological Survey (USGS): In 1990, the USGS published the most thorough and accurate study of the region's groundwater conditions to date. These reports, entitled Geohydrology and Water Quality of Stratified Drift Aquifers in the Exeter, Lamprey and Oyster River Basins, Southeastern New Hampshire and Geohydrologic Groundwater Quality, and Streamflow Data for the Stratified Drift Aquifers in the Lower Merrimack and Coastal River Basins, Southeastern New Hampshire, identified five aquifers within Stratham. The characteristics of

these aquifers were further explained in the 1992 USGS reports entitled, Geologic and Groundwater Quality Data for Stratified Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire and Geohydrology and Water Quality of Stratified Drift Aquifers in the Lower Merrimack and Coastal River Basins, Southeastern New Hampshire. These studies form the basis for the Town's existing aquifer protection ordinance, as well as the Town's Wellhead Protection Program which is currently underway.

A brief description of the aquifers identified by these studies is presented below. The aquifers are labelled on Map 5 (Aquifers and Wells Map) as the Stratham Aquifer, the Bunker Hill Aquifer, the Winnicut River Aquifer, the Skinner Springs Aquifer, and the Guinea Road Aquifer. The various characteristics of the aquifers, as detailed in the above referenced studies, are provided in the accompanying Table 5.

The Stratham Aquifer

This is one of Stratham's two primary aquifers. It is located in the northeastern end of Town, with only a small portion falling within Greenland. The aquifer has a distinct "S" shape, hence its identification as the Stratham Aquifer. It begins along Stratham Lane and extends as far south as Winnicut Road. The aquifer is approximately 743 acres in size and lies mostly within Stratham, except for ten acres extending into Greenland. The aquifer's only sources of recharge are the wetlands which lie above its surface, and precipitation.

The aquifer's saturated thickness contours range from a high of twenty (20) feet within the aquifer's center, to as little as a few feet along the outer edges. The aquifer's groundwater contours range from a high of 140 feet in the aquifer's center, to a low of 110 feet along the outer edges. Within the aquifer, groundwater flows in a southwesterly direction.

The aquifer in its entirety has a transmissivity rate of less than 500 feet^2. The term "transmissivity" refers to the rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient, and is expressed in units of feet squared per day. The transmissivity (T) of an aquifer is equal to the horizontal hydraulic conductivity (K) of the aquifer multiplied by its saturated thickness (b); thus, T=Kb.

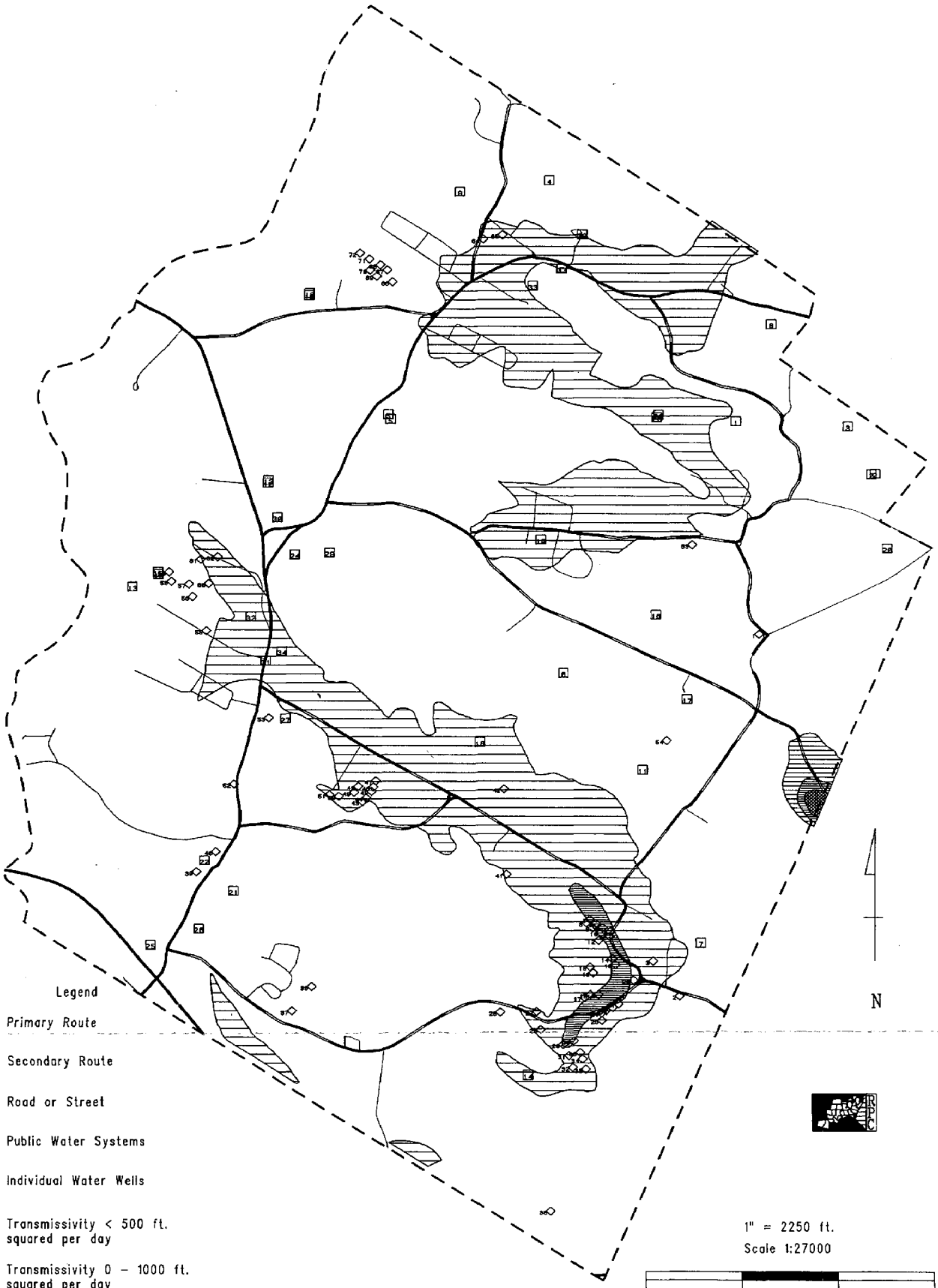
The Bunker Hill Aquifer

This is Stratham's other primary aquifer and is located wholly within Stratham. The aquifer spans the entire length of Bunker Hill Avenue, hence its identification as the Bunker Hill Aquifer. It begins along Patriot's Road, crosses Portsmouth Avenue, and extends as far south as Rolling Farm Road. The aquifer is approximately 873 acres in size. The aquifer's only sources of recharge are the wetlands which lie above its surface, and precipitation.

The aquifer's saturated thickness contours range from a high of twenty (20) feet within the aquifer's center, to as little as a few feet along the outer edges. The aquifer's groundwater contours range from a high of 110 feet just south of the intersection of Bunker Hill Avenue and Union Road, to a low of 70 feet along the aquifer's outer edges. The entire aquifer has a transmissivity rate of less than 500 feet^2, except for a small strip within the aquifer's southern end which has a transmissivity rate of 1,000 - 2,000 feet^2.

Town of Stratham - Aquifers and Wells

MAP 5



Legend

- Primary Route
- Secondary Route
- Road or Street
- Public Water Systems
- Individual Water Wells
- Transmissivity < 500 ft. squared per day
- Transmissivity 0 - 1000 ft. squared per day
- Transmissivity 1000 - 2000 ft. squared per day
- Transmissivity 2000 - 4000 ft. squared per day

N

1" = 2250 ft.
Scale 1:27000

0 feet 2250 4500 6750

Sources: U.S.G.S. Groundwater Investigations, 1990 and 1992.

State of New Hampshire Water Resources Board, "Summary of Well Completion Report Data for the Town of Stratham"; 2/3/93.

State of New Hampshire Water Supply Engineering Bureau, Water Supply & Pollution Control Division, Dept. of Environmental Services: "Public Water Systems Inventory"; 1992.

Prepared by the
Rockingham Planning Commission
June 1, 1993 DRA

The Winnicut River Aquifer

This is a strip-shaped aquifer which begins in Stratham and extends south into Greenland and North Hampton. The vast majority of the aquifer falls within North Hampton, with only small portions extending into Stratham and Greenland. The aquifer's total size is roughly 397 acres, with Stratham's portion consisting of 50 acres. The aquifer receives recharge from three sources: the wetlands above its surface, the Winnicut River, and precipitation. There are three water wells owned by the Hampton Water Works Company located above North Hampton's portion of the aquifer. These wells deliver roughly 1.42 million gallons of water per day. Due to the aquifer's small size, the deposit's saturated thickness contours were not determined, however, the water table was identified at 50 feet above sea level. The majority of the aquifer has a transmissivity rate of 0 - 1,000 feet^2, however, there are two places in Stratham where the rate ranges between 2000 - 4,000 feet^2.

The Skinner Springs Aquifer

This is a small aquifer (less than 40 acres in size) that Stratham shares with Exeter. The majority of the aquifer falls within Stratham, however, at least ten acres are located in Exeter. The aquifer is located between Portsmouth Avenue (Route 101) and Stratham Heights Road. The aquifer is so small that the USGS did not identify any saturated thickness contours, water table contours or the groundwater's flow direction. The aquifer has a transmissivity rate of less than 500 feet^2.

The Guinea Road Aquifer

This is a small aquifer (less than 40 acres in size) which Stratham shares with Exeter. It is located less than 2,000 feet southeast of the Skinner Springs Aquifer and just southeast of Guinea Road. The aquifer's mass is fairly evenly split between Stratham and Exeter. The aquifer is so small that the USGS did not identify any saturated thickness contours, water table contours or the groundwater's flow direction. The aquifer has a transmissivity rate of less than 500 feet^2.

TABLE 5 - AQUIFER CHARACTERISTICS

Aquifer	Total Size (Acres)	Rate of Transmissivity	Saturated Thickness (feet)	Water Table Contours (high to low)	Groundwater Flow Direction
Stratham Aquifer	743	0-500 ft^2	0-20	140-110	southwest
Bunker Hill Aquifer	873	0-2,000 ft^2	0-20	110-70	varies
Winnicut River	397	0-4,000 ft^2	----	50	varies
Skinner Springs	35	>500 ft^2	----	----	------
Guinea Road	35	>500 ft^2	----	----	------

Source: Geohydrology and Water Quality of Stratified Drift Aquifers in the Exeter, Lamprey and Oyster River Basins, Southeastern New Hampshire, USGS, 1989 and Geologic and Groundwater Quality Data for Stratified Drift Aquifers in the Exeter, Lamprey, and Oyster River Basins, Southeastern New Hampshire.

Withdrawal and Discharge Information - Stratified Drift Areas

Information regarding withdrawal and discharge rates for major groundwater users is required to be filed with the Water Resource Division (WRD) of the NH Department of Environmental Services in accordance with the provisions of the NH Code of Administrative Rules Wr 700. Major groundwater users are defined as those operations which use more than 20,000 gallons of water per day (gpd). For major groundwater users who are discharging to an aquifer, a Groundwater Discharge Permit must be obtained from the State. According to a recent review of WRD records, there is one major withdrawal taking place above the Town's stratified drift aquifers, and there are no holders of a Groundwater Discharge Permit above these resources.

The one major withdrawal is taking place above the Skinner Springs Aquifer. The Exeter municipal water system maintains several wells along the Stratham-Exeter border line. These wells are used to augment Exeter's water system, which receives the majority of its water from the Exeter Reservoir and Exeter River. Currently, these wells contribute an average of roughly 80,000 gpd to the municipal water system.

It should be noted that there is one major groundwater withdrawal and discharge taking place above a Stratham aquifer which is not included in the State's groundwater accounting system. The discharge comes from a large residential development built before the State initiated its groundwater user registration program. The development in question is the Thornhill residential development, which consists of 70 two-bedroom, single family homes. The development is located in the southern end of Town, off of Rolling Farm Road. Using the septic system design standards of the Water Supply and Pollution Control Division (WSPCD), it is estimated this development withdraws roughly 21,000 gpd from the aquifer, and discharges the same amount back to the aquifer.

Well Log Data

Map 5 (Aquifers and Wells Map) shows the location of the Town's various public water systems, on-site water wells, and USGS test wells. Data sources used to prepare the map include: the previously cited USGS studies, the "Summary of Well Completion Report Data for the Town of Stratham" dated 2/3/93, and the well site field verification maps prepared by the Water Resources Division.

Appendix B presents the "Well Completion Report Data" in its entirety, including the names and addresses of well owners and selected well data. The accuracy and completeness of the data is entirely dependant on the well drillers. By law, the well drillers are required to send a data sheet for each newly drilled well to the WRD, however, many do not, and many of the submitted data sheets are inaccurate or incomplete. Thus, the information presented in the "Well Completion Report Data" should be used with caution.

The WRD started keeping records on new water well construction in January 1984, and an inventory has been maintained ever since. There is no comprehensive inventory of water wells drilled prior to January 1984, therefore, the older wells cannot be shown on Map 5. According to the Town's "Well Completion Report Data", a total of 348 newly drilled wells were reported between March 1984 and January 1993. However, the WRD has not been able to field verify <u>all</u> newly drilled wells, therefore, only a portion of the wells are shown on Map 5. At this time, the WRD has been able to field verify only 87 wells.

Looking over Map 5, it appears that 40 of the field verified wells are located above the Town's stratified drift deposits, with the remainder located within areas of bedrock and till. It cannot be estimated how many of the 261 wells not mapped by the WRD fall within the Town's aquifer areas until the WRD complete their field verification work.

Bedrock and Till Aquifers

The general location of Stratham's bedrock and till aquifers can be seen on the Aquifers and Wells Map (Map 5). Basically, anywhere outside of the Town's stratified drift deposits is considered a bedrock or till area. The USGS study gives the following description of bedrock and till areas:

> "Bedrock: Solid rock, locally called ledge, that forms the earth's crust. It may be exposed at the surface but more commonly is buried beneath a few inches to more than 100 feet of unconsolidated deposits. Wells that penetrate bedrock commonly yield small supplies of water generally adequate for individual households. Till is an unsorted mixture of clay, silt, sand, gravel, and rock fragments, deposited directly by glacial ice. The till aquifer is considered to be a minor source of groundwater because of its low transmissivity."

Bedrock Conditions

This section describes the nature and extent of bedrock within the Town of Stratham. The presented information comes from the "Interim Geologic Map of New Hampshire", prepared by the US Geologic Survey and the NH State Geologist in 1986 (Scale: one inch equals approximately four miles). According to the above referenced map, there are three major bedrock types in Stratham, consisting of igneous and stratified metamorphic rocks. They are described below in order of their predominance in Town. A graphic depiction of the Town's bedrock geology is presented on Map 4 (Flood Hazards and Bedrock Geology Map).

(1) Eliot Formation. Map symbol: OZe. This formation consists of grey to green phyllite, quartzite and quartz mica schists and well-bedded calc sillicate. This formation covers roughly half of Stratham's land area, and is located as a strip in the middle of Town running north to south.

(2) Kittery Formation. Map symbol: OZk. This bedrock formation consists of phyllite and calcareous siltstone (metamporphic). This formation is found as a strip underlying Stratham's portion of the Squamscott River, and again as a strip underlying the eastern part of Town.

(3) Ordovician Plutons. Map symbol: Oe9. This bedrock formation consists of proxene and pyroxene-mornblende diorite and gabbro, with minor granodiorite and granite. This formation occurs twice in Stratham: the first formation underlies a small area in the Town's northeast corner between Union Road and Hillcrest Drive, while the second formation underlies a small area in the Town's southeastern corner, just west of Marin Way.

According to the article, "Geologic Controls and Radon Occurrence in New England", prepared by Eugene Boudette, Francis Hall, and William Olszewski Jr. of the University of New Hampshire, elevated radon levels are common in most granite formations. Since none of Stratham's bedrock formations have granite as a primary component, the Town's water should be relatively free of radon.

Radon contamination in water has recently become a concern throughout the nation. Radon is a colorless, odorless, cancer-causing gas that is produced as uranium (typically occurring in trace amounts) decays. For example, when a shower is used in a home with water containing radon, radioactive gas diffuses into the air. The article cited above goes on to state that water from deep, bedrock wells is more likely to carry radon than water from shallow, bedrock wells or gravel wells. In New Hampshire, granite bedrock formations typically contain higher radon levels.

Withdrawal and Discharge Information - Bedrock and Till Areas

Once again, information regarding withdrawal and discharge rates for major groundwater users is required to be filed with the Water Resources Division (WRD) of the NH Department of Environmental Services in accordance with the provisions of the NH Code of Administrative Rules Wr 700. Major groundwater users are defined as those operations which use more than 20,000 gallons of water per day. For major groundwater users who are discharging to bedrock and till areas, a Groundwater Discharge Permit must be obtained from the State.

A recent review of WRD records indicate that there are no major groundwater withdrawals located above the Town's bedrock and till areas, however, there is one holder of a Groundwater Discharge Permit. The permit belongs to Turnbury Condominium residential development. The permit allows the development's septic system to discharge as much as 30,000 gpd of wastewater into the ground. In the mid-1980's, the Planning Board approved 72 building lots for this development. Currently, only five three-bedroom residences have been built. Using the WSPCD septic design standards for three-bedroom units, it is estimated that this development currently withdraws roughly 2,250 gpd from its water wells, and discharges the same amount back into the ground.

Once again, it should be noted that there are several major groundwater withdrawals and discharges taking place above Stratham's bedrock and till areas which are not included in the State's groundwater accounting system. These withdrawals and discharges are from large residential developments which were built before the State initiated its groundwater user registration program. These developments include:

1. Salt River Condominiums (78 two-bedroom, single family houses, withdrawing and discharging roughly 23,400 gpd);

2. Glen Gary Condominiums (114 two-bedroom, single family houses, withdrawing and discharging roughly 34,200 gpd);

3. Burnhaven Condominiums (currently 19 three-bedroom, single family houses [although a grand total of 60 house sites have been approved], withdrawing and discharging roughly 12,300 gpd at the present time, however, the development at full build-out will withdraw and discharge as much as 22,500 gpd); and

4. Winding Brook Condominiums (currently 41 two-bedroom, single family houses [although a grand total of 79 lots have been approved], withdrawing and discharging roughly 12,300 gpd at the present time, however, the development at full build out will withdraw and discharge as much as 23,700 gpd).

The general location of these developments (including their water systems and service areas) can be seen on Map 11 (Utilities and Infrastructure) which is found in the upcoming "Description of the Infrastructure" chapter.

Potential Groundwater Supplies

Stratham does not have a municipal water system at this time, and has no plans to utilize its groundwater resources for such a purpose within the planning period (approximately ten years). With the exception of the various public water systems scattered throughout the community, all of the Town's existing development is served by individual, on-site wells.

In terms of water delivery capability and the feasibility of serving the Town's major population clusters, it appears the Stratham Aquifer and the Bunker Hill Aquifer would be the most logical choices for a municipal water supply. These aquifers are large enough to have numerous suitable drilling sites, and both are relatively free of major potential pollution sources.

In the following discussion, an assessment will be made regarding the potential for development above the Stratham Aquifer and Bunker Hill Aquifer. This assessment will be based on the existing development above the aquifers' surface, the existing zoning above the aquifers' surface, and the existing and future land use sections and maps of the Town's most recent Master Plan.

Stratham Aquifer and Bunker Hill Aquifer - Existing Land Use

The majority of land above the Stratham Aquifer is open and undeveloped, although, much of the aquifer's 8,000 feet of frontage along Route 101 does contain a variety of development. The NH Technical College is located on the aquifer's northern side of Route 101, while Stratham Hill Park (which is primarily an open-space, recreational use) is located on the southern side of Route 101. There are also a few residences and small commercial establishments located along this portion of Route 101. Other developed areas above the aquifer include Crestview Terrace (residences), Lovell Road (residences, manufactured housing), Depot Road (residences), Sandy Point Road (residences), Stratham Lane (residences), Gifford Farm Road (residences, school), Long Hill Road (residences), High Street (residences), and Scammon Road (residences). Still, much of the aquifer's surface remains open due to the presence of wetland soils and other restrictive features.

The surface of the Bunker Hill Aquifer is primarily open and undeveloped; much more so than the Stratham Hill Aquifer. The Bunker Hill Aquifer underlies only a limited portion of Route 101 (roughly 2,000 feet of frontage), thus, there are only a few small-scale commercial establishments located above the aquifer. A small portion of the aquifer extends west of Route 101, and this area is primarily residential. Bunker Hill Avenue transverses the majority of the aquifer's surface, and there are several residences, agricultural uses and excavation sites scattered along this road.

There is a substantial amount of residential development along Bunker Hill Avenue south of its intersection with Union Road, and the portion of the aquifer transversed by Stratham Heights Road has a significant amount of residential development as well. Unfortunately, this area is where the aquifer's transmissivity rate is at its highest.

For a graphic depiction of the development above the Stratham Aquifer and the Bunker Hill Aquifer, please review the accompanying Existing Land Use Map (Map 6). This map was prepared in 1985 by the Thoresen Group as part of the Town's most recent Master Plan. Although a Master Plan Update was prepared in 1989, an update of the Existing Land Use Map was not included in the project. The Town plans to prepare a GIS-based land use map in early 1994 as part of the scheduled Master Plan update project.

Stratham Aquifer and Bunker Hill Aquifer - Existing Zoning

The boundaries of the Town's Aquifer Protection District were amended at the March 1992 Town Meeting to reference the aquifers delineated by the previously described USGS study of 1989. The provisions of the Town's Aquifer Protection District are outlined below.

-- The minimum lot size in this district is the same as allowed in the underlying zoning district, however, larger lot sizes may be required depending upon the Town's soil-based lot sizing standards.

-- No more than 20% of any lot may be rendered impervious to groundwater infiltration, and, to the extent feasible, all runoff from impervious surfaces shall be recharged to the aquifer on-site.

-- A developer can exceed the 20% impervious surface limit if a stormwater drainage plan is submitted which provides for the retention and percolation within the aquifer of all development generated stormwater runoff from a ten (10) year storm event, such that the post-development discharge volume to the aquifer is equal to the pre-development discharge to the aquifer. Furthermore, the stormwater drainage plan shall provide for the removal of oil and gasoline from parking lot runoff through the use of treatment swales, oil/gas separators or other devices, prior to retention and percolation of the runoff.

-- Prohibited uses include: on-site disposal, bulk storage, processing or recycling of toxic or hazardous materials or waste; underground storage tanks; dumping of snow carried from off-site; automotive uses; laundry and dry-cleaning establishments; and industrial uses which discharge contact type wastes on-site.

-- Conditional uses include: commercial and industrial uses not otherwise prohibited; multi-family development; excavation operations; and animal feedlots only after consultation with the Rockingham County Conservation District. All of the above uses must comply with the following criteria prior to approval:

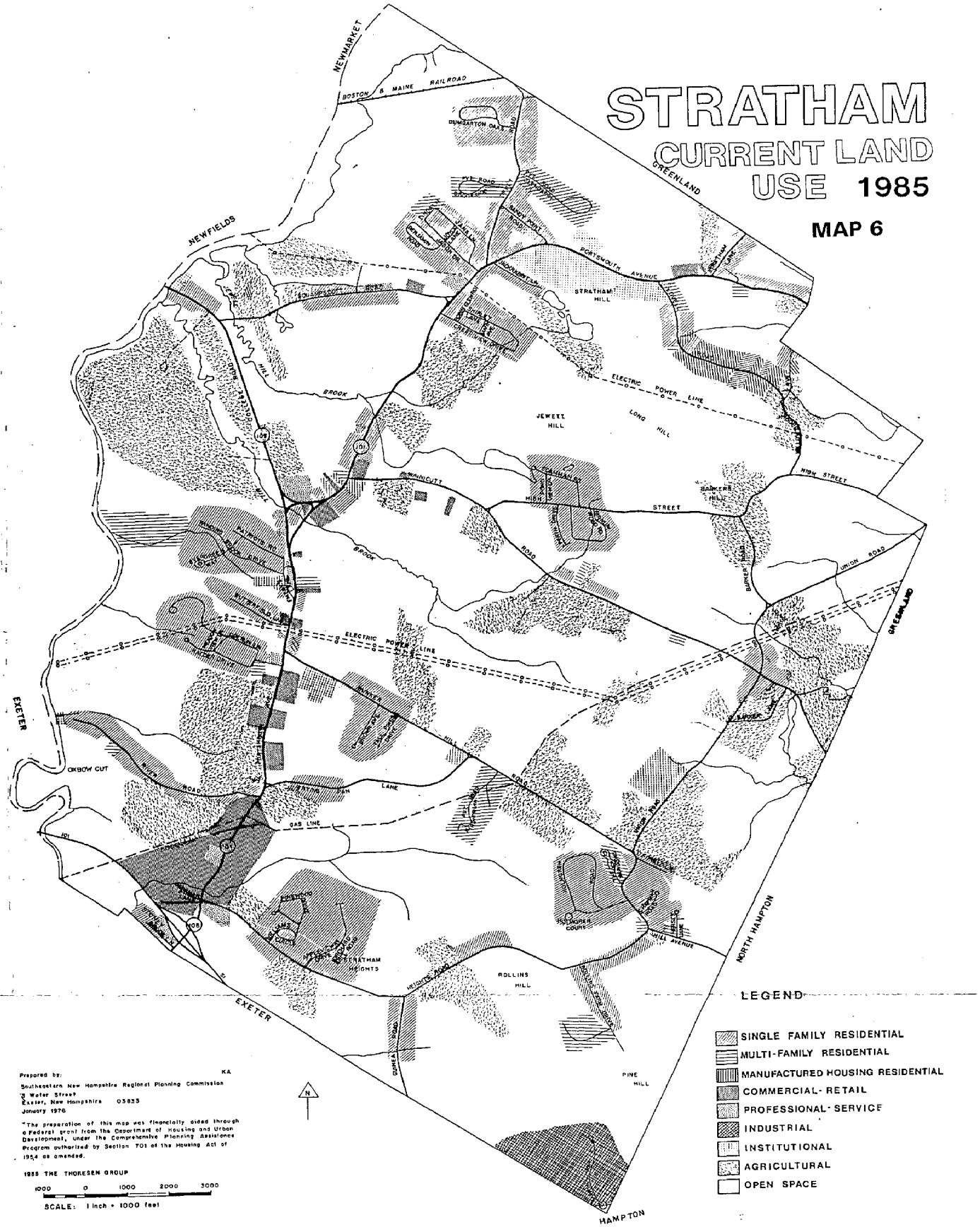
(1) The use will not detrimentally affect groundwater quality, quantity or aquifer storage capacity;

(2) The use will discharge no wastewater on-site other than that typically discharged by domestic wastewater disposal systems; and

(3) The proposed use complies with all other applicable provisions of the Town's aquifer protection ordinance.

-- Permitted uses include: any use permitted by the underlying zoning district; maintenance and repair of any existing structure with conditions; and agricultural and forestry uses with conditions.

The majority of the land above the Stratham Aquifer falls within the Town's Residential/Agricultural District, with only a small portion falling within the Manufactured Housing District. Most of the land above the Bunker Hill Aquifer falls within the Residential/Agricultural District, with only a small portion falling within


STRATHAM
CURRENT LAND USE 1985
MAP 6
NEWMARKET
BOSTON & MAINE RAILROAD
GREENLAND
NEWFIELDS
PORTSMOUTH AVENUE
STRATHAM HILL
ELECTRIC POWER LINE
JEWETT HILL
LONG HILL
WINNICUTT ROAD
HIGH STREET
BARKER'S HILL
UNION ROAD
EXETER
OXBOW CUT
GAS LINE
ROLLINS HILL
STRATHAM HEIGHTS
NORTH HAMPTON
PINE HILL
HAMPTON
LEGEND
SINGLE FAMILY RESIDENTIAL
MULTI-FAMILY RESIDENTIAL
MANUFACTURED HOUSING RESIDENTIAL
COMMERCIAL- RETAIL
PROFESSIONAL- SERVICE
INDUSTRIAL
INSTITUTIONAL
AGRICULTURAL
OPEN SPACE
Prepared by: KA
Southeastern New Hampshire Regional Planning Commission
3 Water Street
Exeter, New Hampshire 03833
January 1976
*The preparation of this map was financially aided through a Federal grant from the Department of Housing and Urban Development, under the Comprehensive Planning Assistance Program authorized by Section 701 of the Housing Act of 1954 as amended.
1985 THE THORESEN GROUP
1000 0 1000 2000 3000
SCALE: 1 inch = 1000 feet

the Professional/Residential District. The provisions of these various zoning districts are outlined below. For a graphic depiction of Stratham's current zoning arrangement, please review the accompanying Stratham Zoning Map (Map 7).

1. Residential/Agricultural District

   -- The minimum lot size is one acre for single family residences and 1.5 acres for duplexes, however, this could be increased based on the Town's soil-based lot size standards.

   -- The minimum frontage requirement is 150 feet for single family residences and 175 feet for duplexes.

   -- The maximum allowable impervious surface lot coverage is 20%.

   -- Permitted uses include: single family dwellings; duplexes, cluster developments; manufactured housing; public parks and playgrounds; historic buildings and sites; forestry, wildlife, timber preserves, reservoirs, and nature study areas; farming; tree farming, commercial timbering and non-commercial harvesting of forest products; cemeteries; excavation operations, and municipal buildings and public schools.

   -- Special exceptions: home occupations; accessory apartments; overnight and day camps, cottage colonies, vacation resorts, hostels and similar recreational facilities; bed and breakfast inns; commercial riding stables and riding trails; recreational camping parks, recreational areas, recreational tenting, and recreational vehicles; private schools; day care and senior citizen facilities; non-profit lodges and fraternal organizations; churches; public utilities; and kennels.

2. Manufactured Housing District

   -- The minimum lot size is one acre for single family residences and 1.5 acres for duplexes, however, this could be increased based on the Town's soil-based lot size standards.

   -- The minimum frontage requirement is 100 feet for single family residences and 175 feet for duplexes.

   -- The maximum allowable impervious surface lot coverage is 25%.

   -- Mobile home parks shall consist of a minimum of ten acres and two lots.

   -- Each lot in a mobile home park shall contain at least 30,000 square feet, have a depth of at least 150 feet, and frontage of at least 100 feet.

   -- Permitted uses include: single and two-family dwellings; manufactured housing; mobile homes; forestry, wildlife, timber preserves, reservoirs, and nature study areas; public parks and playgrounds; historic buildings and sites; farming; tree farming, commercial timbering and non-commercial harvesting of forest products; cemeteries; excavation operations, and municipal buildings and public schools.

-- Special exceptions include: home occupations; accessory apartments; overnight and day camps, cottage colonies, vacation resorts, hostels and similar recreational facilities; bed and breakfast inns; commercial riding stables and riding trails; recreational camping parks, recreational areas, recreational tenting, and recreational vehicles; private schools; day care and senior citizen facilities; non-profit lodges and fraternal organizations; churches; and public utilities.

3. Professional/Residential District

-- The minimum lot size is one acre for single family residences and 1.5 acres for duplexes, however, this could be increased based on the Town's soil-based lot size standards.

-- The minimum frontage requirement is 200 feet.

-- The maximum allowable impervious surface lot coverage is 30%.

-- Permitted uses include: single and two-family dwellings; forestry, wildlife, timber preserves, reservoirs, and nature study areas; public parks and playgrounds; historic buildings and sites; farming; churches; cemeteries; municipal buildings and public schools; and professional services.

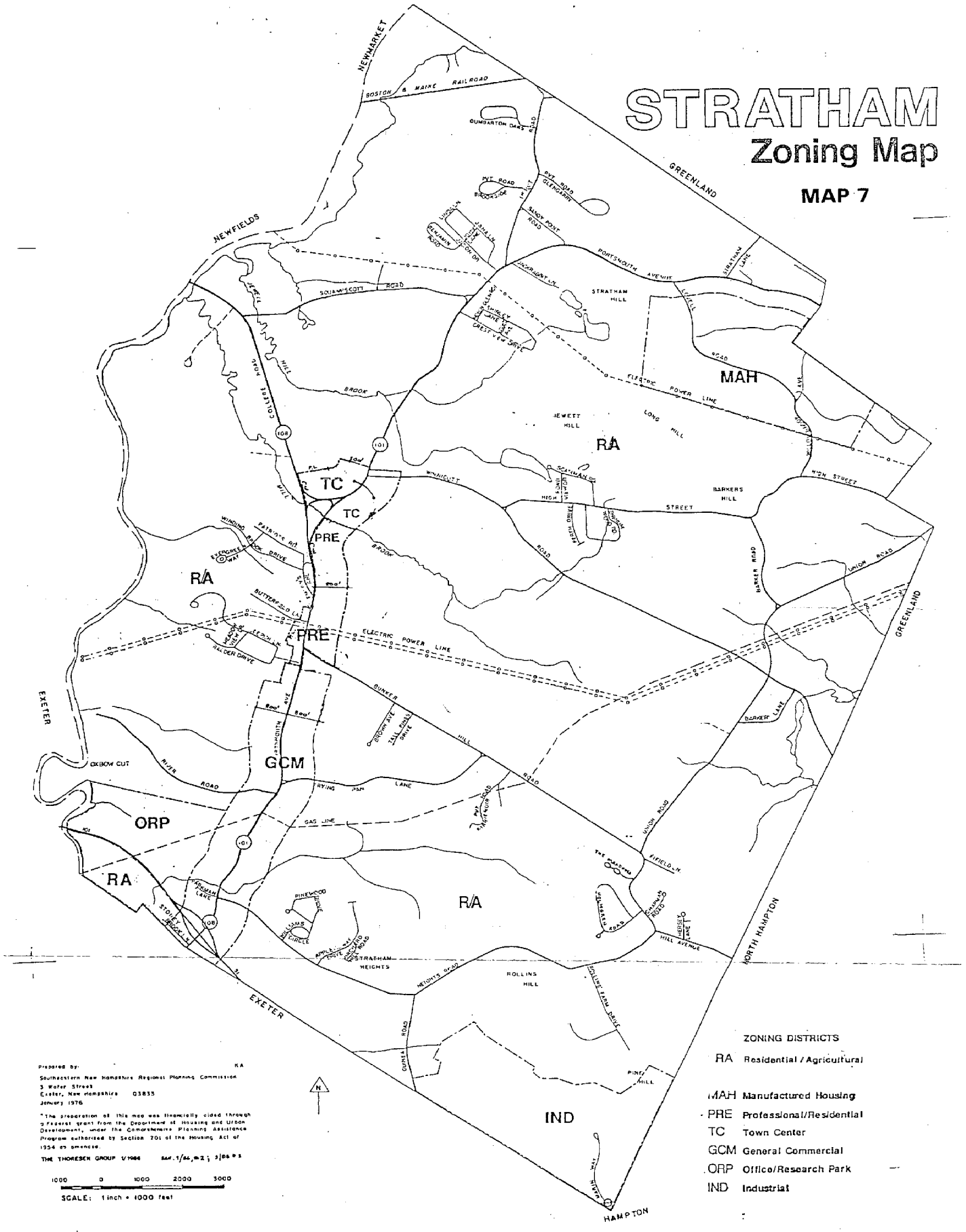
-- Special exceptions include: cluster developments; home occupations; accessory apartments; bed and breakfast inns; senior citizen facilities; banks and lending institutions and public utilities.

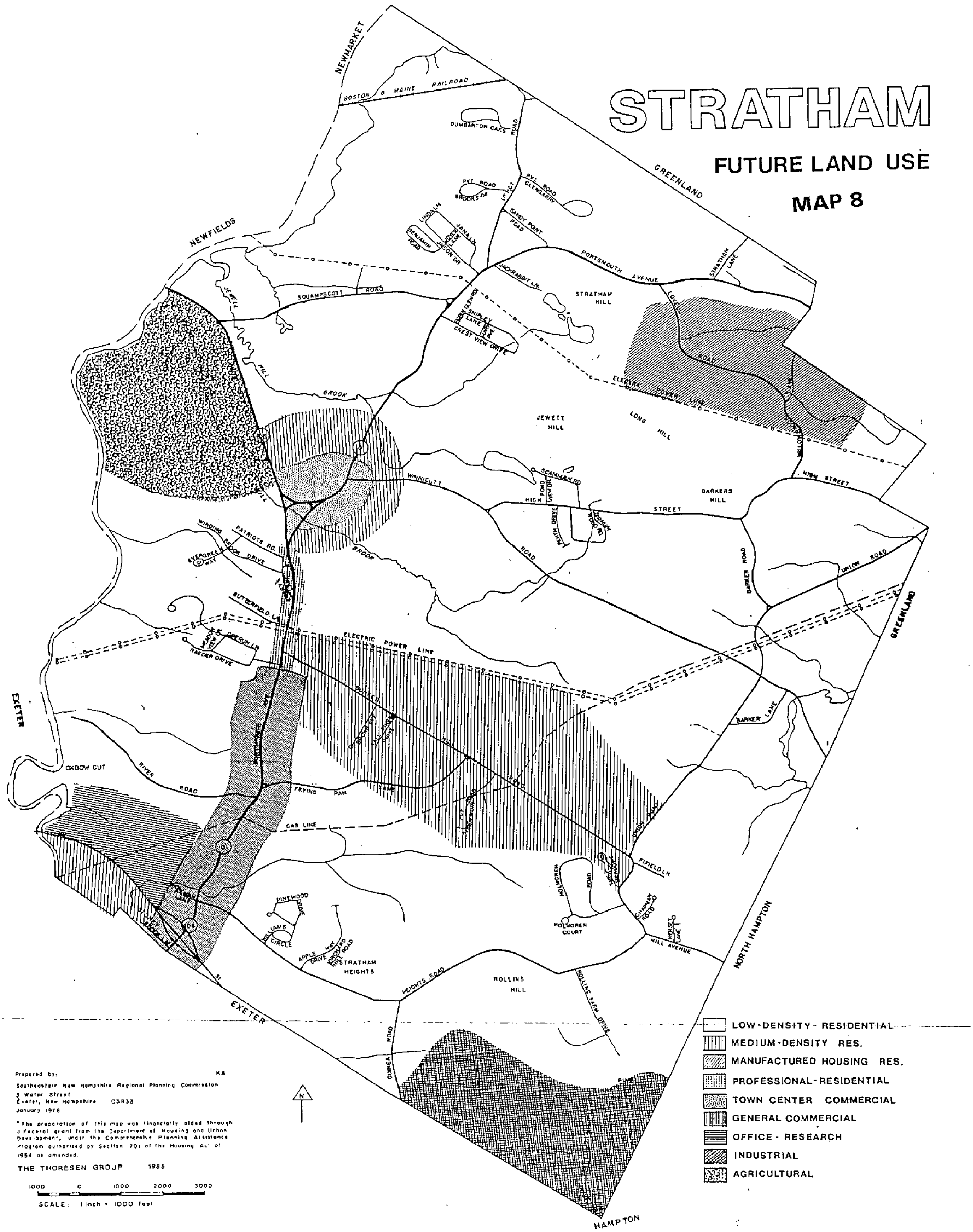
Stratham Aquifer and Bunker Hill Aquifer - Future Land Use

As mentioned previously, the Town's existing Master Plan was prepared in 1985 by the Thoresen Group. The Master Plan Update of 1989 consisted of nothing more than updating the numerical tables throughout the Master Plan. The Planning Board has recently appointed a citizen's advisory group to begin outlining the required tasks of a Master Plan update. It is expected that the update project will begin in early 1994.

In the absence of a more recent future land use plan for the Town, the 1985 Master Plan's Future Land Use Map will be reviewed for this section. The 1985 Future Land Use Map is included here as Map 8. Comparing the Town's current Zoning Map to the Future Land Use Map of 1985 indicates the majority of the zoning changes recommended by the 1985 Master Plan have been implemented.

There were, however, several recommended zoning changes from the 1985 Master Plan which the Town did not implement. The first was the establishment of an agricultural district extending west from College Road to the Squamscott River. The second was the establishment of three medium-density residential districts; one south of Route 101-51, another surrounding the existing Town Center district, and another straddling both sides of Bunker Hill Avenue (directly above the Bunker Hill Aquifer). The Town does not have any plans to implement these zoning proposals in the near future.


STRATHAM
Zoning Map
MAP 7
NEWMARKET
BOSTON & MAINE RAILROAD
GREENLAND
NEWFIELDS
EXETER
NORTH HAMPTON
HAMPTON
MAH
RA
TC
PRE
GCM
ORP
IND
STRATHAM HILL
JEWETT HILL
LONG HILL
BARKERS HILL
ROLLINS HILL
PINE HILL
STRATHAM HEIGHTS
ELECTRIC POWER LINE
GAS LINE
OXBOW CUT
ZONING DISTRICTS
RA Residential / Agricultural
MAH Manufactured Housing
PRE Professional/Residential
TC Town Center
GCM General Commercial
ORP Office/Research Park
IND Industrial
Prepared by:
Southeastern New Hampshire Regional Planning Commission
3 Water Street
Exeter, New Hampshire 03833
January 1976
"The preparation of this map was financially aided through a Federal grant from the Department of Housing and Urban Development, under the Comprehensive Planning Assistance Program authorized by Section 701 of the Housing Act of 1954 as amended."
THE THORESEN GROUP
1000 0 1000 2000 3000
SCALE: 1 inch = 1000 feet


STRATHAM
FUTURE LAND USE
MAP 8
NEWMARKET
GREENLAND
NEWFIELDS
EXETER
NORTH HAMPTON
HAMPTON
BOSTON & MAINE RAILROAD
DUMBARTON OAKS ROAD
PORTSMOUTH AVENUE
SQUAMPSCOTT ROAD
STRATHAM HILL
JEWETT HILL
LONG HILL
BARKERS HILL
ELECTRIC POWER LINE
WINNICUTT
HIGH STREET
BARKER ROAD
UNION ROAD
BARKER LANE
RIVER ROAD
OXBOW CUT
FRYING PAN
GAS LINE
FIFIELD LN.
HILL AVENUE
STRATHAM HEIGHTS
ROLLINS HILL
HEIGHTS ROAD
ROLLINS FARM DRIVE
GUINEA ROAD
PINEWOOD
WILLIAMS CIRCLE
HOLMGREN COURT
LOW-DENSITY RESIDENTIAL
MEDIUM-DENSITY RES.
MANUFACTURED HOUSING RES.
PROFESSIONAL-RESIDENTIAL
TOWN CENTER COMMERCIAL
GENERAL COMMERCIAL
OFFICE - RESEARCH
INDUSTRIAL
AGRICULTURAL
Prepared by:
KA
Southeastern New Hampshire Regional Planning Commission
3 Water Street
Exeter, New Hampshire 03833
January 1976
"The preparation of this map was financially aided through a Federal grant from the Department of Housing and Urban Development, under the Comprehensive Planning Assistance Program authorized by Section 701 of the Housing Act of 1954 as amended.
THE THORESEN GROUP 1985
1000 0 1000 2000 3000
SCALE: 1 inch = 1000 feet

Need for Further Study

Overall, it is expected the Town will continue to utilize its existing water supply sources for the foreseeable future, and definitely within the planning period (approximately ten years). If additional sources are deemed necessary, the Town's groundwater resources are the most feasible option. In the event that Stratham would desire to utilize either the Stratham Aquifer or the Bunker Hill Aquifer as a municipal water supply source, a detailed water supply study would be required. Items to address in this study should include:

1. The aquifer's potential water delivery capability;
2. The aquifer's existing water quality;
3. The cost of water treatment;
4. The potential threats posed by existing land uses;
5. The potential threats posed by the existing zoning scheme;
6. How to regulate land uses above the aquifer;
7. Options for water storage;
8. Options for water distribution; and
9. Secondary impacts such as:
   - A. Potential de-watering of adjacent wetlands;
   - B. Potential affects on the area's water table;
   - C. Potential changes to the base flows of adjacent watercourses;
   - D. Potential affects on existing water wells within the area; and
   - E. The current impact of existing public water systems including their plans for expansion (if such plans exist).

The above items constitute only a partial list of items which could be addressed by a detailed water supply study. Such a study should be requested of any large-scale development proposal which plans on utilizing a public water system. For the Town's existing public water systems, studies which address the above items have not been prepared as a matter of course. However, such studies should be required prior to further expansion of existing public water systems, unless the Planning Board has already given its approval for additional phases of a particular development.

IDENTIFICATION OF POTENTIAL THREATS

Regarding the source information (both data and maps) used to describe and map the potential threats to water resources in Stratham, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers such information to be the best available information existing at this time.

The primary source used for this section was the document entitled, Inventory of Groundwater and Surface Water Potential Nonpoint Pollution Sources, compiled by the Strafford-Rockingham Planning Commission in February 1982. This will be referred to in the text as the "RPC Nonpoint Inventory". Additional information was provided by various governmental agencies, local municipal officials and department heads.

The State of New Hampshire has delineated two general types of pollution sources: nonpoint and point. The NH Office of State Planning defines nonpoint pollution sources as those sources which are diffuse in nature and discharge pollutants over an area into the environment. Typically, nonpoint sources of pollution include urban and rural runoff, leachates from land disposal of solid and liquid wastes, agricultural runoff, sediment due to timber harvesting activities and road salt applications. Nonpoint sources can be difficult to pinpoint since some are of a short-lived nature, induced by storm events or activities occurring over a brief period of time. Some nonpoint sources, such as leachate from landfills and failed septic systems, are more easily located.

Point pollution sources, on the other hand, are defined as any discernible, confined or discrete conveyance from which pollutants are or may be discharged, including but not limited to: pipes, ditches, channels, tunnels, conduits, wells, containers, rolling stock, concentrated animal feeding operations or vessels.

Potential Nonpoint Pollution Sources

Using the RPC Nonpoint Inventory and information from local officials, the potential nonpoint pollution sources in Stratham were identified on the accompanying Potential Pollution Sources Map (Map 9). A description of these sources is presented below. Unless stated otherwise, the sources described do not have monitoring wells located on-site and no detailed water quality data is available. In Stratham, examples of existing nonpoint pollution sources include:

1. Salt Piles and Snow Dumps: There is one Town-owned salt pile located along Bunker Hill Avenue at the site of the Town Garage. This facility stores approximately 150 tons of road salt at any given time. The salt is stored in an enclosed area with a concrete floor underneath. Bell & Flynn Inc., also have a salt pile at their Bunker Hill Avenue facility. This facility stores as much as 30 tons of road salt at any given time. The salt is stored in an enclosed area with a concrete floor underneath. Bell & Flynn Inc. also use a portion of their site for a snow dump, however, its use will be discontinued in the near future due to the presence of the Bunker Hill Aquifer underneath. The company is contracted by two businesses in Exeter to remove snow from their parking areas after heavy snow events. Sources: RPC Nonpoint Inventory, Town Road Agent and Bell & Flynn Inc..

2. Salted Roads: All of the paved roads in Stratham receive some degree of salting during the winter months, with the exception of Jack Rabbitt Lane which is a dirt road. Source: RPC Nonpoint Inventory and the Town Road Agent.

3. Road Salt Contamination Sites: There are 13 well sites in Town which have been contaminated by road salt. The majority of occurrences have taken place along Routes 101 and 108, however there are a few sites along Bunker Hill Avenue and Winnicut Road. All of the wells have been replaced by the NH Department of Transportation. The locations of these sites are denoted by the symbol "S" on Map 9. Source: Records of the DES Waste Management Division and NH DOT.

Town of Stratham - Potential Pollution Sources

MAP 9

- Town Salt Pile
- Salt Contamination Sites
- Gas Stations and Automotive Repairs
- Storm Drains
- Veterinary Clinics and Kennels
- Print Shops
- Commercial Operations
- Beauty Parlor
- Newly Approved Development Projects
- Medical Offices
- Industries and Manufacturing
- RCRA Facilities
- SARA Facilities
- Groundwater Hazards
- Underground Storage Tanks
- Non Salted Roads
- Active Cemetery
- Abandoned Excavation Sites
- Excavation Sites
- Excavation Sites being Reclaimed
- Pet Cemetery
- Septage Haulers
- Excavation Contractors
- Transfer Station/ Abandoned Municipal Landfill
- Pesticide Application Sites
- Farms

Prepared by the Rockingham Planning Commission
June 2, 1993 DRA

4. Municipal Landfill: There is an abandoned municipal landfill located along the western side of Union Road. Use of the landfill was discontinued in 1980, after thirty years of service. At its peak, this facility served approximately 2,500 Stratham residents. The landfill is unlined, however the site has been capped with clay, loamed and seeded. A landfill closure plan was submitted to the Waste Management Division of the NH Department of Environmental Services in January of 1992, however, the plan has yet to be approved by the State. There are four monitoring wells located on-site. After four rounds of well testing, no significant water quality problems have been detected. Two nearby streams have also been sampled without detecting any serious water quality problems. The landfill currently serves as a transfer station where residents can dispose of bulky items, metals, brush and recyclables. Sources: discussions with the Town's Administrative Assistant; and records of the DES Waste Management Division.

5. Excavation Operations and Maintenance of Excavation Equipment: There are three active excavation sites in Stratham, all located along Bunker Hill Avenue. There is also a pit in the process of being reclaimed, located along Union Road near the abandoned landfill. In addition, there are two abandoned pits that have yet to be reclaimed. The first is located along Bunker Hill Avenue across from the Stratham Municipal Center, and the second is located along the base of Foss Hill behind the Municipal Center. There are four gravel excavators based in Stratham although their pits are located elsewhere. These operations include: Stratham Excavations (Stratham Heights Road); Jackson Excavation (High Street); Kenneth Blood & Sons (Portsmouth Avenue), and; Hanna Well Drilling (Portsmouth Avenue). The potential threat associated with these operations is the on-site maintenance of excavation equipment. Source: Stratham Lot-Size Inspector.

6. Active Cemeteries: There are five cemeteries at two locations in Stratham which still take internments. The first site is a parcel of land along Emery Lane which is home to the Harmony Hill, Maple Lane, Congregational Society, and Congregational cemeteries. The second site is a parcel of land located along Union Road which is home to the Greenwood cemetery. Sources: USGS topographic maps and Town Tax Collector.

7. Gas Stations, Engine Repair and Automotive Shops: There are nine such uses within Stratham, however, only seven are active. The active uses include: Stratham Tire (tire sales, auto repair), Sullivan Tire (tire sales, auto repair), Undercar Specialist (auto repair), Gill's car dealership (car sales and repair), the Honda Barn (car sales and repair), Charter Gas and Stratham Village Market (gas). The two non-active sites are the old Labonte Sunoco Station and the old C&E Mobil Station. All of these sites are located along Portsmouth Avenue. There are also two small engine repair shops in Town: Steele Engine Repair (Portsmouth Avenue), and a site located off of Bunker Hill Avenue. The locations of the establishments listed above are denoted by the symbol "A" on Map 9. Sources: Planning Board and Town Business Records.

8. Pesticide Application Sites, Farms and Agricultural Uses: There are ten agricultural uses in Stratham which have used pesticides in the recent past. These operations grow a variety of produce including: vegetables, flowers, berries and tree fruit. In addition, there are two nurseries and one greenhouse in Stratham. Many of these sites obtain their pesticides from the Stratham Agway located along Portsmouth Avenue. There are also six horse farms and two dairy farms in Stratham. The locations of the pesticide application sites, nurseries, greenhouse and the Stratham Agway are denoted by the symbol "PA" on Map 9, while the horse and dairy farms are denoted by the symbol "F". For a detailed description of the pesticides used at each site, please review Appendix C.

It should be noted that Stratham participates in the Seacoast Area Mosquito Control (SAMC) program. After flooding events, SAMC crews spray a biological pesticide ("BTI") on the wetlands along the Squamscott River, and, to a lesser extent, freshwater wetlands throughout Town. Sources: NH Department of Agriculture and discussions with local officials.

9. Urban Runoff and Storm Drains: In early 1992, the Rockingham Planning Commission conducted a partial field inventory of potential threats for the eastern half of the RPC region. Several types of potential threats were mapped by RPC personnel using a tape and compass and USGS topographic maps. The results of the inventory are contained in the document, Pollution Source Identification in the RPC Region - Phase I, which was prepared in June of 1992. Storm drains which handled runoff from paved areas of over one acre in size were included in the inventory. In Stratham, there are 13 such storm drains scattered throughout Town. The locations of these sites are denoted by the symbol "R" on Map 9.

10. Septage Haulers: These operations pump out residential septic tanks and transport the septage to lagoons or wastewater treatment facilities outside of Stratham. There are two such operations in Stratham: the first is Stratham Hill Septic located along Jason Drive, and the second is Exeter Septic, located along Winnicut Road. Source: Town Business Records.

11. Medical Offices: There are seven sites in Stratham where medical offices are located. Along Portsmouth Avenue one can find the Stratham Family Health Center, Exeter Sports Medicine Center, Breakfast Hill Oral Surgeons, two doctors and a chiropractor. There is also a dentist office just off of Portsmouth Avenue on Raeder Drive. Doctor and dentist offices affiliated with the Exeter Hospital dispose of their medical wastes at the hospital's incinerator, otherwise, medical offices must make their own waste disposal arrangements. The locations of Stratham's various medical establishments are denoted by the symbol "M" on Map 9. Source: Town Business Records and discussions with local officials.

12. Veterinary Clinics and Kennels: There are five such operations in Stratham. The NH Society for the Prevention of Cruelty to Animals (SPCA) has a kennel located along Portsmouth Avenue. Minor medical procedures are also performed at this facility. The Exeter Veterinary Hospital is located along Stratham Heights Road. Also, there is a small kennel located along Squamscott Road. Lastly, there are two pet shops in Stratham: one in the Stratham Plaza and one in the King's Highway Plaza. The locations of these establishments is denoted by the symbol "a" on Map 9. Source: Town Business Records.

13. Print Shops and Printing Presses: There are two such operations in Stratham. Rockingham County News and Squamscott Press are both located along Portsmouth Avenue. The locations of these sites are denoted by the symbol "P" on Map 9. Source: Town Business Records.

14. Commercial Operations: There are a number of commercial operations in Stratham which store, use and dispose of hazardous chemicals and/or substances. Along Portsmouth Avenue, these operations include: Stratham Fuels Inc. (fuel storage); the Antique Repair Co. (paints, thinners and furniture stripping); Stratham Hill Bicycle (paints and safety clean), and; Eurocleaners (dry cleaning chemicals). There is also the B.R. Jones Roofing Company (metal work, asphalt and tar storage) located along Winnicut Road. In addition, there is a woodworking shop located along Lovell Road and a taxidermy shop along College Road (Route 108). The locations of these sites are denoted by the symbol "C" on Map 9. Source: Town Business Records.

15. Beauty Salons: Beauty parlors often use chemicals which, if disposed of improperly, could pose a threat to groundwater resources. There are five such establishments in Stratham. Both the Stratham Plaza and the King's Highway Plaza contain such uses. Small-scale beauty shops are also located along Squamscott Road, Winnicut Road and Portsmouth Avenue. The locations of these sites are denoted by the symbol "B" on Map 9. Source: Town Business Records.

16. Industries and Manufacturing Establishments: There are several industries in Stratham which use regulated substances as defined by the NH Groundwater Protection Act of 1991 (RSA 485-C). The Town's primary industrial area is the Stratham Industrial Park located in the southern corner of Town along Marin Way. Chief among the park's industries are: Hewlett - Packard (use of regulated chemicals); Complex Medical Products (use of regulated chemicals), and; Lindt & Sprungli USA (food processing - chocolate). The locations of Stratham's industries and manufacturing operations are denoted by the symbol "I" on Map 9. Source: Town Business Records and discussions with various local officials.

17. Newly Approved Development Projects: There are several newly approved development projects taking place within Stratham which will involve a significant amount of earth disturbance. Chief among them are: an 18 lot subdivision of off Depot Road to be served by an interior road; a seven lot subdivision along River Road to be served by an interior road, a fast-food restaurant for the front of King's Highway Plaza, and; completion of the last phase of the Winding Brook Condominium project located off of Winding Brook Drive. Source: Stratham Planning Board records.

Potential Point Pollution Sources

Stratham is relatively free of point pollution sources, i.e., those sources confined to a specific, discernible location. There are no CERCLA (Superfund) sites in Town, nor are there any National Pollution Discharge Elimination System (NPDES) permit holders. Such permits are usually required for the discharge of treated waters into a surface water resource.

There is one Groundwater Discharge Permit which belongs to the Turnbury Condominium development. The permit allows the development's septic system to discharge as much as 30,000 gallons of wastewater per day into the ground. As mentioned in the "Description of Groundwater Resources" chapter, there are several other large wastewater discharges in Town which are not included in the State's groundwater accounting system. These discharges are from the septic systems of several large-scale residential developments which were built before the State initiated the Groundwater Discharge Permit system.

There are several facilities regulated under Title III of SARA (Superfund Amendment Reauthorization Act) and several facilities regulated under the National Resource Conservation and Recovery Act (RCRA). There are also several potential contamination sites identified by the DES Groundwater Protection Bureau.

Facilities Regulated Under SARA and RCRA

Although the SARA and RCRA programs both deal with hazardous waste generation, there are some important differences. The SARA program deals with emergency response planning in the event of a hazardous waste accident, whereas the RCRA program deals more with the storage and disposal of hazardous wastes. Such planning is coordinated between state and local fire response officials. Since SARA and RCRA both deal with hazardous wastes, it is not uncommon to find a facility regulated under both programs. The table presented in Appendix D describes the establishments in Stratham which are regulated under SARA and RCRA. For the SARA sites, the table presents the following information: site owner, site location, type and quantity of hazardous wastes located on-site, and the noted physical and health hazards associated with each substance. The RCRA sites are listed by owner and street address.

Records of the Groundwater Protection Bureau

The Groundwater Protection Bureau of DES maintains an inventory of existing and abandoned solid waste disposal sites, sites which have been investigated for groundwater contamination, leaking underground storage tanks and potentially hazardous land uses which are regulated under other federal and/or state programs. Items listed in the Groundwater Protection Bureau's inventory are considered point pollution sources. The inventory is from a print-out dated December of 1992, and is presented Appendix E.

Underground Storage Tanks

Underground storage tanks (UST) are a potential threat to water resources in that leaking can occur due to defects in tank construction, improper installation, and corrosion of older tanks. New Hampshire requires all tanks with a capacity of 1,100 gallons or more to be registered and the use reported to the Waste Management Division of the NH Department of Environmental Services (DES).

According to the most recent records of the DES, there are 17 active USTs having capacities of 1,100 gallons or greater at 12 locations scattered throughout Stratham. In addition, the Bureau has identified several leaking UST sites in Town. The leaking UST sites can be found in the threat inventory of the Groundwater Protection Bureau (Appendix E). Although municipal officials believe there are many abandoned USTs scattered throughout Town, a comprehensive inventory has not been compiled at this time.

The State's UST listing was provided by the Waste Management Division of the NH Department of Environmental Services in a print-out dated August, 1992. This information was verified by Commission personnel in January 1993 with assistance from the Town's Administrative Assistant, Emergency Response Coordinator and local tank owners. A recent review of development proposals currently before the Planning Board indicate there are no new developments planning on using USTs.

The general locations of all known active USTs and leaking USTs in Stratham are shown on the Potential Pollutant Sources Map (Map 9). For the active tanks, details relative to tank location (street address), owner's name, capacity, type of construction, dates placed in and/or out of service (as applicable), type of product stored, and description of the leak detection system (if any) is presented in Appendix F.

Potential Threats - Existing and Future Land Use

This section will describe the Town's existing development pattern, existing zoning arrangement and future land use plans as they relate to water resources. This section is based on the Existing Land Use Map (Map 6) and Future Land Use Map (Map 8) prepared by the Thoresen Group as part of the 1985 Master Plan (the most recent master planning effort), and the Town's existing Zoning Ordinance and Map (Map 7). As mentioned previously, the Town plans to embark on a Master Plan update project in early 1994.

Existing Land Use

Residential Development: There is no prominent concentration of residential development nor a distinct downtown area, rather, the residential pattern is quite dispersed. Extensive residential frontage development can be seen along the following roads: Stratham Heights Road, Bunker Hill Avenue, Winnicut Road, Union Road, High Street, River Road, Depot Road and Lovell Road. The majority of large residential subdivisions are served by their own interior roads. Multi-family housing is scattered throughout Town along the same roads listed above. Mobile homes and manufactured housing are primarily located in the northeastern corner of Town, along Lovell Road and Willowbrook Avenue. This is essentially the Town's manufactured housing zoning district. There are also mobile homes located on individual lots scattered throughout Town.

According to the latest figures of the NH Office of State Planning and the Town's building permit data for 1992, single family homes account for approximately 64% of the Town's total housing stock, multi-family housing accounts for 33%, and manufactured housing (mobile homes, pre-built housing) makes up the remaining 3%. In real numbers, the latest breakdown is as follows: 1,295 single family homes, 668 multi-family units, and 46 manufactured housing units.

Commercial and Industrial Development: The vast majority of Stratham's commercial development occurs as a strip along either side of Portsmouth Avenue, beginning at the Exeter town line and extending just past the traffic circle. There are few other commercial establishments scattered throughout Town, however, they are small-scale in nature; mostly home occupations. In terms of industrial development, Stratham's Industrial Park along Marin Way in the Town's southernmost corner is the primary location.

Existing Zoning Arrangement

Currently, there are seven zoning districts in Stratham, not including the environmental overlay districts. Of the seven districts, two are residential in nature, three are commercial, one is a mixture of residential and professional uses, and one is industrial. A graphic depiction of the Town's existing zoning arrangement is presented on Map 7 (Stratham Zoning Map). A description of the various zoning districts, including a discussion of their permitted uses which could potentially threaten the community's water resources, is presented below.

Residential/Agricultural (RA): This district covers the majority of land in Stratham, with the exception of the southern Portsmouth Avenue corridor and the other zoning districts located in the corners of Town. The minimum lot size is one acre for single family homes and 1.5 acres for duplexes. The Town does utilize soil-based lot sizing standards, thus, the required lot size may be larger if warranted by the site's soil properties. The required frontage is 150 feet for single family homes and 175 feet for duplexes.

The district is primarily one of single family homes, however, the following uses are also permitted by right: duplexes; cluster developments; manufactured housing; forestry, wildlife, timber preserves, reservoirs and nature study areas; public parks and playgrounds; historic buildings or sites; farming and agriculture; tree farming; cemeteries; municipal buildings and public schools; SPCA facilities, and; excavation operations.

Special exceptions include: home occupations; accessory apartments; overnight and day camps, cottage colonies, vacation resorts, hostels and similar recreational facilities; bed and breakfast inns; commercial riding stables and trails; recreational camping parks and areas, residential tenting and recreational vehicles; private schools; day care facilities; senior citizen centers; non-profit lodges and fraternal organizations; churches; public utilities, and; kennels.

Manufactured Housing (MAH): This district is located in the northeast corner of Town, and has frontage on Lovell Road and Willowbrook Road. The minimum lot size is one acre for single family homes and 1.5 acres for duplexes. The soil-based lot sizing standards may necessitate a larger lot size. The required frontage is 100 feet for single family homes and 175 feet for duplexes. The district is primarily one of manufactured housing units and mobile homes. Other permitted uses include: single family homes; two family dwellings; forestry, wildlife, timber preserves, reservoirs and nature study areas; public parks and playgrounds; historic buildings or sites; farming and agriculture; tree farming; cemeteries; municipal buildings and public schools, and; excavation operations. The special exceptions are the same as the Residential/Agricultural District, with the exception of kennels which are not permitted.

Professional/Residential (PRE): This district runs along Portsmouth Avenue from Bunker Hill Avenue to the traffic circle. The minimum lot size is one acre for single family homes and 1.5 acres for duplexes. The soil-based lot sizing standards may necessitate a larger lot size. The required frontage is 200 feet for all uses. The district's permitted uses include: single and two family dwellings; historic buildings and sites; forestry, wildlife, timber preserves, reservoirs and nature study areas; churches; cemeteries; farming and agriculture; municipal buildings and public schools; professional services, and; SPCA facilities. Special exceptions include: cluster developments; home occupations; accessory apartments; bed and breakfast inns; senior citizen centers; public utilities, and; banks and lending institutions.

Town Center (TC): This is a small district located in the vicinity of the traffic circle. The minimum lot size is one acre for single family homes and 1.5 acres for duplexes. The soil-based lot sizing standards may necessitate a larger lot size. The required frontage is 100 feet for all uses except duplexes which require 175 feet. The district's permitted uses include: single and two family dwellings; cluster developments; bed and breakfast inns; hotels and motels; forestry, wildlife, timber preserves, reservoirs and nature study areas; public parks and playgrounds; historic buildings and sites; tree farming; senior citizen centers; churches; cemeteries; municipal buildings and public schools; retail sales and services; business services; professional services; banks and lending institutions; research and development, corporate and business offices; restaurants, and; veterinary hospitals.

Special exceptions include: accessory apartments; farming and agriculture; private schools; day care facilities; non-profit lodges and fraternal organizations; public utilities; hospitals, clinics, and nursing homes and rehabilitation centers; funeral parlors, plus; filling stations and service stations.

General Commercial (GCM): This district runs along both sides of Portsmouth Avenue from the Exeter border almost to the beginning of Reader Drive and Bunker Hill Avenue. The minimum lot size is one acre for all uses except for duplexes which must have 1.5 acres. The soil-based lot sizing standards may necessitate a larger lot size. The required frontage is 200 feet for all uses.

Permitted uses include: bed and breakfast inns; hotels and motels; forestry, wildlife, timber preserves, reservoirs and nature study areas; public parks and playgrounds; historic buildings and sites; farming and agriculture; tree farming; municipal buildings and public schools; retail sales and services; business services; professional services; banks and lending institutions; research and development, corporate and business offices; restaurants; filling stations and service stations; motor vehicle dealerships and auto repair shops; veterinary hospitals, and excavation operations.

Special exceptions for this district include: two family dwellings; cluster developments; private schools; day care facilities; hospitals, clinics, and nursing homes and rehabilitation centers; funeral parlors; public utilities; kennels; adult uses; warehousing and wholesaling operations; freight and trucking terminals, and; commercial sawmills.

Office/Research Park (ORP): This district is located in the southwest corner of Town, south of River Road and between Portsmouth Avenue and the Squamscott River. The minimum lot size is one acre (larger depending on soils), and the required frontage is 150 feet.

Permitted uses include: forestry, wildlife, timber preserves, reservoirs and nature study areas; public parks and playgrounds; historic buildings and sites; municipal buildings and public schools; business services; professional services; research and development, corporate and business offices; warehousing and wholesaling operations; bulk storage and distribution of goods (excluding fuels), and; excavation operations. Special exceptions include: day care facilities; hospitals, clinics, and nursing homes and rehabilitation centers, and; public utilities.

Industrial (IND): This district is located in the southern corner of Town and is accessed by Marin Way. The minimum lot size is two acres (larger depending on soils), and the required frontage is 150 feet. Permitted uses include: forestry, wildlife, timber preserves, reservoirs and nature study areas; historic buildings and sites; municipal buildings and public schools; business services; professional services; research and development, corporate/business offices; banks and lending institutions; warehousing and wholesaling operations; manufacturing and assembly operations; bulk storage and distribution of goods (excluding fuels), and; excavation operations.

Special exceptions include: public parks and playgrounds; farming and agriculture; tree farming; private schools; day care facilities; non-profit lodges and fraternal organization; hospitals, clinics, and nursing homes and rehabilitation centers; public utilities; retail sales; freight and trucking terminals; commercial sawmills, and; junk yards and recycling centers.

For the commercial and industrial districts, situations where the permitted uses may be potentially hazardous include: laundromats, beauty parlors, print shops, and other service establishments which use chemicals and/or produce wastewater; doctor, dentist, and veterinary offices which produce medical wastes; large, paved parking areas which inadequately handle surface water runoff; automotive uses; and manufacturing and assembly establishments which inadequately store, use, and dispose of petroleum products and other hazardous chemicals.

Future Land Use

As mentioned previously in the potential groundwater supply section of the "Description of Groundwater Resources" chapter, the Town's most recent future land use plan comes from the 1985 Master Plan prepared by the Thoresen Group. It is expected that a new master planning process will begin in early 1994. In the absence of a more recent future land use plan for the Town, the 1985 Master Plan's Future Land Use Map (included here as Map 8) will be reviewed for this section.

Comparing the Town's existing zoning scheme with the 1985 Future Land Use Map indicates that a majority of the zoning changes recommended by the 1985 Master Plan have been implemented. There were, however, several recommended zoning changes from the 1985 Master plan which were not implemented. The first was the establishment of an agricultural district located between College Road (Route 108) and the Squamscott River. Although such a district would help to preserve open space and limit the possibilities of pollution from commercial and industrial development, having farms and agriculture as the sole permitted uses could increase the risk of contamination from pesticides, fertilizers, animal feed lots and manure storage. This would certainly have negative implications for the Squamscott River and Mill Brook, which is a tributary to the river. The Town does not have any plans to establish such a district at this time.

The second recommended zoning change which did not get implemented was the establishment of three medium density residential districts: one south of Route 101-51, another surrounding the existing Town Center district, and another straddling both sides of Bunker Hill Avenue (directly above the Bunker Hill Aquifer). These districts would not have any significant detrimental effect on the Town's water resources, for the soil-based lot sizing standards and the provisions of the Aquifer Protection District would eliminate the possibility of over-taxing the soil's ability to absorb and treat wastewater discharged from on-site septic systems. The Town does not have any plans to establish these districts at this time.

Master Plan Considerations

In addition to the Future Land Use Plan and Map of the 1985 Master Plan, there are other sections of the plan which have implications for the Town's water resources. The Town's Open Space Plan, prepared in 1989 by the Rockingham Planning Commission also contains several recommendations which deal with water resources. A summary of the various Master Plan considerations is presented in the following pages.

1985 Master Plan: Policies and Recommendations

Policy: "It is the policy of the Town of Stratham to maintain the rural residential character of the community by encouraging the preservation of open space and development based on the adequacy of the site." (p.123)

> Recommendation: The Planning Board should..."review the development of a public sewer service in neighboring towns and determine its impact on Stratham including the possibility of extending the line(s) to parts of Stratham." (p.124)
>
> Recommendation: The Conservation Commission should..."encourage the donation of, accept, and/or purchase significant wetlands and other lands and manage them in the Town's interest." (p.124)

Policy: "It is the policy of the Town of Stratham to work with the Boston & Maine Railroad to improve recreation access to Great Bay." (p.128)

> Recommendation: The Town should..."meet with Boston & Maine officials to review the problem and possible solutions." (p. 128)
>
> Recommendation: The Town should..."consider applying for coastal zone or other public or private monies to address the solutions." (p. 128)

Policy: "It is the policy of the Town of Stratham to protect the health, safety and welfare of its residents by enforcing all ordinances pertaining to on-site water sources and sewage disposal systems." (p. 129)

> Recommendation: The Town should..."establish minimum regulations higher than the WSPCD standards pertaining to on-lot sewage disposal system and minimum distances from property lines, surface water and open drainage as appropriate." (p. 130)
>
> Recommendation: The Town should provide for the..."inspection of all (septic) systems by qualified personnel." (p. 130)
>
> Recommendation: The Planning Board should..."consider proposals incorporating new technology for limited private water and sewer systems in new developments or developments needing to address problems in keeping with WSPCD standards." (p. 130)

Policy: "It is the policy of the Town of Stratham to protect potential public water supply sources from development." (p. 130)

> Recommendation: The Town should..."hire a water system engineer to identify and evaluate potential sources of water for a municipal water system." (p. 130)
>
> Recommendation: The Planning Board should..."develop an overlay zone for aquifer and water supply system protection and recommend adoption." (p. 130)
>
> Recommendation: The Town should..."purchase the land or development rights to key parcels, if needed, to protect future town water supplies." (p. 130)

Policy: "It is the policy of the Town of Stratham to encourage development with the potential need for a public sewer system near existing neighborhood sewer lines." (p. 130)

> Recommendation: The Town should..."meet with neighboring communities to determine their plans vis-a-vis expansion or development of their sewer systems." (p. 131)

Recommendation: The Planning Board should..."review the findings and recommend action (or no action) in the Capital Improvements Program." (p. 131)

Recommendation: "If the sewer line is extended or a suitable limited site specific system is developed, the Planning Board (should) review and revise accordingly its development criteria for that area." (p. 131)

Recommendation: The Planning Board should..."identify appropriate location(s) for a sewage treatment plant and consider acquisition in the event it is needed in the future." (p. 131)

Policy: "It is the policy of the Town of Stratham to improve the recreation access to Great Bay." (p. 137)

Recommendation: The Town should..."work with the Boston & Maine Railroad and the State of New Hampshire to change the railroad bridge to allow boats to pass under it, if feasible." (p. 138)

Recommendation: The Town should..."work with the Town of Greenland and the NH Fish and Game Department to improve access to Great Bay at the foot of Depot Road." (p. 138)

Recommendation: The Town should..."initiate a feasibility study to improve the Town Landing on River Road." (p. 138)

Policy: "It is the policy of the Town of Stratham to maintain and improve the water quality of the Squamscott River for recreation purposes." (p. 138)

Recommendation: The Town should..."protect the Squamscott River from possible pollution by working with the abutting landowners, the WSPCD, and the Rockingham County Conservation District on wise land stewardship." (p. 138)

Recommendation: The Planning Board should..."review existing regulations and develop new regulations if appropriate to protect the natural resources of the Squamscott River watershed." (p. 138)

Recommendation: The Town should..."work with all municipalities abutting the Squamscott River to develop and enforce similar standards." (p. 138)

Policy: "It is the policy of the Town of Stratham through its regulatory powers to limit and/or control development in environmentally sensitive areas to include: wetlands, flood plains, potential public water supplies, aquifers, steep slopes in excess of 15%, and other areas with poor soils and/or inadequate drainage." (p. 139)

Recommendation: The Planning Board should..."review soil, slope, wetlands, flood plains, topographic, and any other natural resource or historic identification maps as part of its planning process when development proposals are made." (p. 139)

Recommendation: "If a development proposal appears to be in an environmentally sensitive area based on the Planning Board's review, the Planning Board (should) request site specific data regarding specific environmental concerns." (p. 140)

Recommendation: The Conservation Commission should..."investigate and approve all construction in wetland areas." (p. 140)

Recommendation: The Planning Board should..."review and recommend changes, if desired, in the Zoning Ordinance, Subdivision Regulations and Site Plan Review Procedures to be consistent with this policy." (p. 140)

1989 Open Space and Recreation Plan: Goals and Recommendations

Wetlands

Recommendations: The Town of Stratham should...

-- "Perform a wetlands evaluation and adopt Prime Wetlands designation for the municipality's most important wetlands." (p. 58)

-- "Encourage the enforcement of current zoning, subdivision and site plan review regulations, as well as state and federal rules/laws pertaining to wetlands." (p. 58)

-- "Continue to review Dredge and Fill applications." (p. 58)

-- "Protect the most important wetlands by easement and/or acquisition." (p. 58)

Floodplains

Recommendations: The Town of Stratham should...

-- "See that the Town, as a participant in the National Flood Insurance Program, keeps its floodplain ordinance up to date and consistent with the program's requirements." (p. 58)

-- "Attempt to acquire lands or interest in lands in floodplain areas - especially those along the Squamscott River and Great Bay." (p. 58)

-- "Review proposed developments or alterations in floodplains for compliance with local, state, and federal requirements - especially with respect to waste water disposal and erosion." (p. 58)

Shorelands

Recommendations: The Town of Stratham should...

-- "Improve public access to the water bodies in Town by acquiring more shorefront land or easements." (p. 58)

-- "Maintain the Shoreland Protection District to prevent detrimental alteration of the land close to the shores." (p. 58)

Groundwater

Recommendations: The Town of Stratham should...

-- "Perform an inventory of well water quality and continue to monitor." (p. 58)

-- "Perform an inventory of possible future public water sources and adopt an aquifer protection ordinance." (p. 58)

The 1989 Open Space and Recreation Plan also contains goals and recommendations regarding habitat areas and aesthetic considerations. These goals and recommendations have an indirect benefit to the Town's water resources, simply because they emphasize the maintenance of habitat areas and scenic vistas. Since these resources are primarily found along riverbanks and shorelines, the recommendations do imply a benefit for the Town's water resources. Please review the Town's 1989 Open Space and Recreation Plan for the complete set of goals and recommendations set forth in the plan.

Potential Pollution Sources - Inside and Outside Stratham

As the Squamscott River is one of the major tributaries to the Great Bay estuary - New Hampshire's premiere marine ecosystem - Stratham planners should keep track of potential pollution sources along the banks of the river and its tributaries within the Town. Stratham's existing Shoreland Protection Ordinance and District does much in terms of limiting potential threat opportunities along the Town's riverbanks. The Town's various municipal boards should continue to stringently enforce the provisions of this ordinance.

Currently, there are three wastewater treatments plants discharging to the Squamscott River: facilities owned by the towns of Exeter, Newfields and Newmarket. Certainly this situation has been a contributing factor to the water quality problems of the river as well as Great Bay. As mentioned previously in the "Description of Surface Water Resources" chapter, the river does not meet the water quality standards of its Class B designation, and the bay is periodically closed to shellfish harvesting due to high bacteria counts. Stratham planners should be aware of any plans to upgrade neighboring wastewater treatment facilities and comment on such plans when deemed appropriate.

Stratham planners should also monitor development activity taking place within the watersheds which it shares with neighboring communities, and participate in any watershed-wide protection efforts. Monitoring development activity within the watersheds could be achieved by simply obtaining the Planning Board agendas of the other watershed communities. In turn, the Stratham Planning Board could send its monthly agenda to the Planning Boards of the other watershed communities. In addition to keeping the Stratham Planning Board informed on development activity within its watersheds, this process will go a long way towards inspiring inter-community communication and cooperation. Reviewing the Planning Board agendas of neighboring watershed communities could be a regular monthly agenda item for the Stratham Planning Board.

Regarding groundwater protection, Stratham planners should continue to monitor existing potential threats located above the Town's aquifers. The existing Aquifer Protection Ordinance does much in terms of limiting threat opportunities above Stratham's aquifers, and the Town's various municipal boards should continue to stringently enforce the provisions of this ordinance. The Planning Board is currently engaged in preparing a Wellhead Protection Program which should further enhance the Town's groundwater protection efforts.

In an effort to obtain a comprehensive groundwater database, the Planning Board should consider revising its land use policies to require a detailed water supply study for proposed community water systems and large public water systems. Such a study could be required on a Town-wide basis or only when such systems are planning to locate above an aquifer. Requiring such a study could be a provision of the Town's Aquifer Protection Ordinance, or could be a single provision within the Subdivision Regulations and Site Plan Review Regulations.

As part of a detailed water supply study, the Town could ask that the following items be addressed: the aquifer's water quality, the system's overall impact on the aquifer's rate of recharge and water delivery capability, and secondary impacts such as the potential for de-watering adjacent wetlands, potential affects on the surrounding water table, potential changes to the base flows of adjacent watercourses, potential affects on existing water wells within the area, and the current impact of existing public water systems including their plans for expansion (if such plans exist).

DESCRIPTION OF THE INFRASTRUCTURE

Regarding the source information (both data and maps) used to describe and map the infrastructure of Stratham, the municipality considers such information to be, at a minimum, as detailed and as accurate as the maps or information replaced. The municipality considers the source information to be the best available information existing at this time.

Septic System Usage

According to the latest figures of the NH Office of State Planning, there are 5,035 residents in Stratham, and 2,009 housing units. Dividing the total population by the total housing units yields a person per household figure of 2.5. The person per household figure will be used throughout this chapter for a variety of purposes, including: calculating the number of Stratham residents served by community water and septic systems, calculating the number of Stratham residents served by individual water wells and septic systems, estimating the Town's existing water demands, and projecting the Town's future water demands.

Septic disposal in Stratham is handled entirely by individual, on-site septic systems and community septic systems. The Town does not have a municipal sewer system, nor are there any plans for the establishment of such a system within the planning period (approximately the next ten years). A review of Planning Board records indicate that 452 housing units are served by community septic systems. Using the person per household figure, it is estimated that roughly 1,130 Stratham residents are served by community septic systems. Subtracting the number of houses served by community septic systems from the Town's total housing stock indicates that roughly 1,557 Stratham households are served by individual, on-site septic systems. Using the person per household figure, it is estimated that approximately 3,905 residents (or 77% of the Town's total population) are served by on-site, individual septic systems.

Situations of septic system failure are handled by the Town's Code Enforcement Officer and, in extreme cases, the Town's Health Officer. According to a recent review of records maintained by the Code Enforcement Officer, instances of septic system failure have been scattered throughout Town, with the majority of cases being those systems located in close proximity to the major rivers and streams, as well as in areas containing high water tables. Many of the failed systems were installed before the NH Water Supply and Pollution Control Division established rules regarding septic system placement.

The more rural areas of Stratham have a high percentage of soils which contain moderate to severe limitations for the placement of on-site septic systems. For a graphic depiction of these areas, as well as areas rated high in terms of septic system suitability, please review the accompanying Septic System Limitation Map (Map 10). This map should not lead one to believe that areas of low suitability cannot be utilized for the placement of septic systems, rather, the map's purpose is to point out limitations which must be dealt with during the building phase. Many of the environmental constraints can be mitigated through corrective measures taken by the developer.

Town of Stratham
Soil Suitability for Septic Systems
MAP 10

- Water
- Very Low Suitability
- Low Suitability
- Medium Suitability
- High Suitability
- Very High Suitability
- Not Rated/Too Variable

0 3500 7000 10500

Scale in Feet

Sources: "Soils Potential for Development-Rockingham County": U.S.D.A.-Soil Conservation Service and Rockingham County Conservation Dist.; May 1987.

Rockingham County, N.H. Soils Map: U.S.D.A.-Soil Conservation Service. March 1980
Preliminary Data - Subject to Change

Prepared by the Rockingham Planning Commission, May 1989 SRG

According to the soil rating matrix prepared by the Rockingham and Strafford County Conservation Districts (see Appendix A), Stratham's land area is fairly evenly divided between soils containing severe limitations for the placement of on-site septic systems, and soils of medium to high suitability. Significant concentrations of soils with low suitability include: a large area between Stratham Heights Road and the Stratham Industrial Park; an area encircled by Route 101, Stratham Heights Road, and Bunker Hill Avenue; much of the land directly abutting the Squamscott River, and; much of the land on either side of Union Road, north of its intersection with Bunker Hill Avenue.

Significant concentrations of soils having high to medium suitability include: land in the southernmost corner of Town within the Stratham Industrial Park, and the land which fronts on the Town's major roads: Route 101 (Portsmouth Avenue), Route 108 (College Road), Bunker Hill Avenue, Stratham Heights Road, Winnicut Road, Lovell Road, Depot Road and portions of High Street.

The soil properties of proposed development sites need to be thoroughly evaluated during the subdivision and site plan review process, prior to the installation of septic systems. To this end, the Planning Board does review all subdivision and site plans with respect to potential soil/septic system problems.

Under State law (RSA 149-M:13), each community must have its own septage disposal facility, or a formal agreement with another municipality to utilize their facility. Currently, there are no permitted septage disposal sites located within the Town, however, Stratham does have an agreement with Hampton to use their wastewater treatment plant for septage disposal. Septage from Stratham is brought to the plant by private septage haulers who are charged a fee by the Town of Hampton. Thus, although this is an inter-municipal agreement, the disposal fees are paid by the haulers and not the Town.

Solid Waste Disposal

According to the document entitled, Feasibility Review and Design Report for a Material Recovery Facility, prepared for the Lamprey Regional Solid Waste Cooperative by Alternative Resources Inc. and Kimball Chase Co. in December of 1992, Stratham produces approximately 3,748 tons of solid waste per year. This total includes both residential and non-residential waste estimates. In addition to the above total, Stratham's recycling program receives an average of 185 tons of recyclable materials per year.

The Town's transfer station, located at the site of the old municipal landfill along Union Road, is the only solid waste disposal facility in Stratham that has a permit from the State under RSA 149-M. Four monitoring wells have been installed on-site as part of the landfill's closure plan. After four rounds of well testing, no significant water quality problems have been detected. Two nearby streams have also been sampled with no serious water quality problems noted. There are no existing permit violations at this site, however, the landfill's closure plan has yet to be approved by the State. Stratham does not plan on expanding this site within the foreseeable future.

At the transfer station, Stratham residents can dispose of bulky items, metals, brush and recyclables. The bulky items are deposited into a roll-off which is then brought to the Turnkey Landfill in Rochester, NH. Metals are baled on-site and sold for scrap. Brush is burned on-site. Stratham's recycling program includes the following items: glass (clear, brown and green), newsprint, aluminum cans, plastics, tin and steel cans.

Curb-side pick up of trash is provided by Waste Management of New Hampshire Inc., a solid waste hauler out of Rochester. Waste Management brings the trash to the waste-to-energy incinerator at the University of New Hampshire (UNH) in Durham. Stratham uses this facility as part of its membership in the Lamprey Regional Solid Waste Cooperative. It is anticipated that UNH will no longer accept solid waste in the near future, thus, the Cooperative is currently investigating other disposal options.

Public Water Supplies

As mentioned previously, Stratham residents receive their water entirely from on-site water wells, and public water systems as defined by RSA 485:1. According to the RSA, there are three types of public water systems: community water systems, non-community water systems, and non-community, transient water systems. These systems are defined as follows:

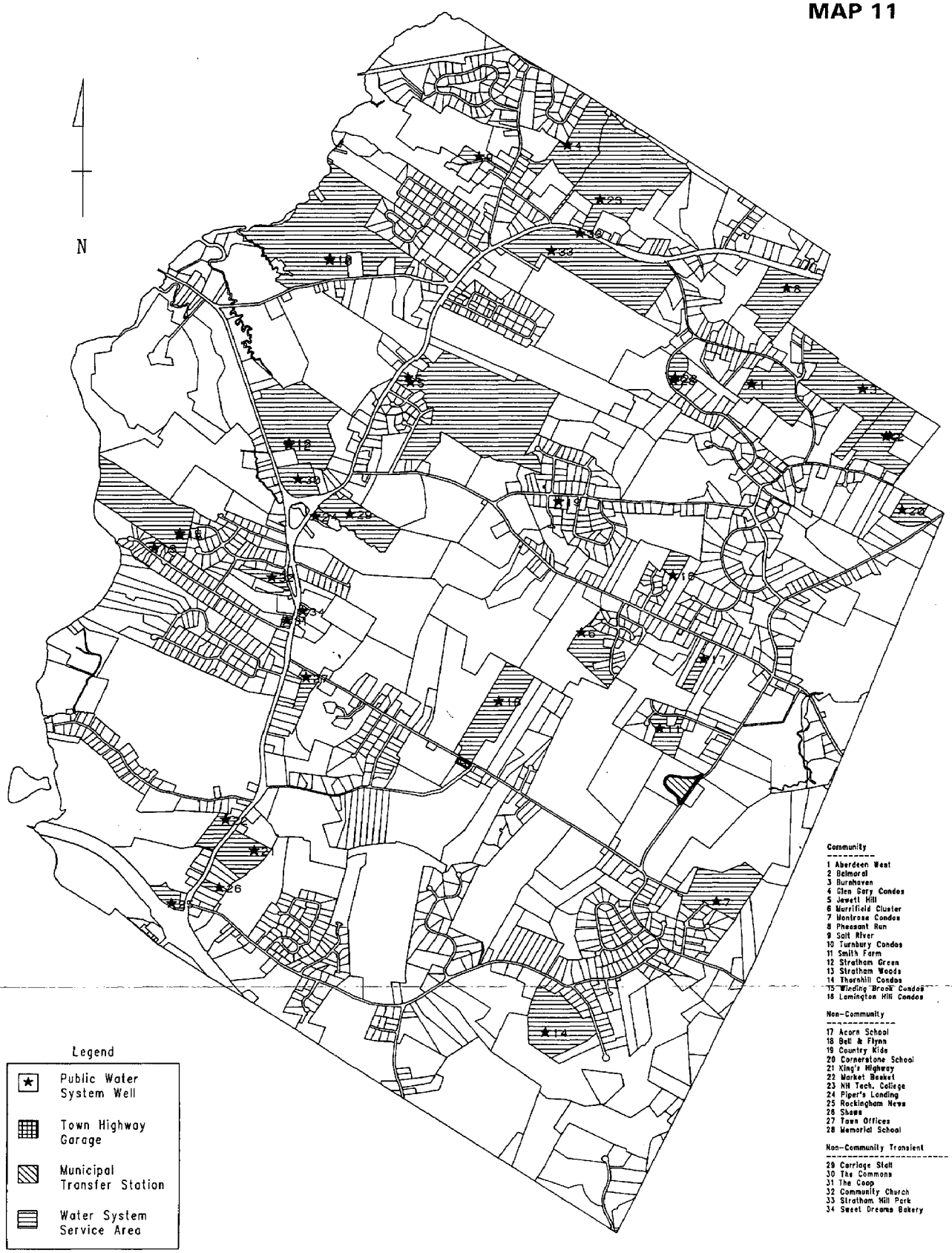
> **Community Water System:** A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Community water systems are usually associated with residential developments.
>
> **Non-Community Water System:** A public water system which serves the same 25 people, or more, over six months per year. Examples of this type of system include: schools, government buildings, and large industries.
>
> **Non-Community, Transient System:** A public water system which serves a transient population of 25 people, or more, over six months per year. Examples of this type of system include: restaurants, churches and parks.

Public water systems are periodically tested by the Engineering Bureau of the Water Supply and Pollution Control Division within the NH Department of Environmental Services (DES). Starting in January 1993, the community and non-community water systems will receive an annual Safe Drinking Water Analysis (SDWA) which involves testing for the following items: iron, manganese and other metals, inorganics, volatile organic compounds, pH, and radon. Prior to January 1993, these systems received an SDWA every three years. The non-community, transient systems receive an SDWA every six years. Historically, community water systems are tested monthly for bacteria. Beginning in January 1993, the two types of non-community systems will be tested for bacteria every three months, however, it remains to be seen whether DES has the staff to comprehensively implement this new requirement.

According to the most recent records of the NH Department of Environmental Services, there are 34 active public water systems located in Stratham. These systems are described in the following pages and their general locations, including their service areas, can be seen on Map 11 (Utilities and Infrastructure).

Town of Stratham - Utilities and Infrastructure

MAP 11



1" = 2250 ft.
Scale 1:27000

0 feet 2250 4500 6750

Prepared by the
Rockingham Planning Commission
June 1, 1993 DRA

Community Water Systems

1. Glen Gary Condominiums: Located off of Depot Road, this development consists of 114 two-bedroom, single family homes. Using the person per household figure (2.5), the development's population is estimated at 285 people. The water system consists of two bedrock wells, both of which are 300 feet deep. One well can deliver 25 gallons per minute (gpm), while the other can deliver 30 gpm. When combined, these wells have the capacity to deliver 79,200 gallons per day (gpd) if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses (300 gpd), it is estimated the system has an existing daily water demand of approximately 34,200 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

2. Salt River Condominiums: Located off of Brookside Drive, this development consists of 78 two-bedroom, single family homes. Using the person per household figure, the development's population is estimated at 195 people. The water system consists of two bedrock wells, one is 140 feet deep while the other is 240 feet deep. One well can deliver 50 gpm, while the other can deliver 65 gpm. When combined, these wells have the capacity to deliver 165,600 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses, it is estimated the system has an existing daily water demand of approximately 23,400 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

3. Thornhill Condominiums: Located off of Rolling Farm Road, this development consists of 70 two-bedroom, single family homes. Using the person per household figure, the development's population is estimated at 175 people. The water system consists of two bedrock wells, one is 500 feet deep while the other is 585 feet deep. One well can deliver 19 gpm, while the other can deliver 30 gpm. When combined, these wells have the capacity to deliver 70,560 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses, it is estimated the system has an existing daily water demand of approximately 21,000 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

4. Montrose Condominiums: Located off of Hersey Lane, this development consists of 84 one-bedroom, single family homes. The president of the condominium association estimates the development's population at 160 people. The water system consists of two bedrock wells, both of which are 160 feet deep. Both wells can deliver 20 gpm. When combined, these wells have the capacity to deliver 57,600 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for one-bedroom houses (225 gpd), it is estimated the system has an existing daily water demand of approximately 18,900 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

5. Burnhaven Condominiums: Located off of Willow Brook Road, this development currently consists of 19 three-bedroom, single family homes; however, an additional 41 units have been approved. Using the person per household figure, the development's current population is estimated at 48 people; however, 150 people are expected when the development is fully built-out. The water system consists of two bedrock wells, both of which are 180 feet deep. One well can deliver 25 gpm, while the other can deliver 30 gpm. When combined, these wells can deliver 79,230 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses (450 gpd), it is estimated the system has an existing daily water demand of approximately 8,550 gpd. Once fully built-out, the system's water demand is estimated at 22,500 gpd. Thus, the system's demand is well below its delivery capability, even after full-build out. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

6. Stratham Green Condominiums: Located off of College Road (Route 108), this development consists of 24 four-bedroom, duplexes; however, and additional six units have been approved. Using the person per household figure, the development's current population is estimated at 120 people; however 150 people are expected when the development is fully built-out. The water system consists of two bedrock wells, one is 260 feet deep while the other is 460 feet deep. One well can deliver 15 gpm, while the other can deliver 20 gpm. When combined, these wells can deliver 50,400 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for four-bedroom duplexes (600 gpd), it is estimated the system has an existing daily water demand of approximately 14,400 gpd. Once fully built-out, the system's water demand is estimated at 18,000 gpd. Thus, the system's demand is well below its delivery capability, even after full build-out. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

7. Balmoral Condominiums: Located off of High Street, this development consists of 42 two-bedroom, single family homes. Using the person per household figure, the development's population is estimated at 105 people. The water system consists of two bedrock wells, both of which are 140 feet deep. One well can deliver 30 gpm, while the other can deliver 50 gpm. When combined, these wells can deliver 115,200 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses, it is estimated the system has an existing daily water demand of approximately 12,600 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

8. Winding Brook Condominiums: Located off of Winding Brook Drive, this development currently consists of 41 two-bedroom, single family homes; however, an additional 36 homes are planned for the future. Based on the person per household figure, the development's population is currently estimated at 103 people; however, once fully built-out, the development could have a total population of approximately 200 people. The water system consists of two bedrock wells, both of which are 340 feet deep. Both wells can deliver 30 gpm. When combined, these wells can deliver 86,400 gpd if pumped continuously over

24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses, it is estimated the development has an existing water demand of approximately 12,300 gpd. Once fully built-out, the development's water demand is estimated at 23,700 gpd. Thus, the system's demand is well below its delivery capability, even after full build-out. The facility manager has not noted any water pressure or water quality problems as yet.

9. Jewett Hill: Located off of Portsmouth Avenue (Route 101), this development consists of 26 four-bedroom, single family homes. The president of the condominium association estimates the development's population at 90 people. The water system consists of two bedrock wells, both of which are 200 feet deep. One well can deliver 54 gpm, while the other can deliver 65 gpm. When combined, these wells can deliver 171,360 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for four-bedroom houses (600 gpd), it is estimated the system has an existing daily water demand of approximately 15,600 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are several additional phases planned for this development, however, none have been approved by the Planning Board at this time.

10. Lamington Hill Condominiums: Located off of Winnicut Road, this development consists of 14 four-bedroom, single family homes. The president of the condominium association estimates the development's population at 45 people. The water system consists of two bedrock wells, one is 300 feet deep while the other is 360 feet deep. One well can deliver 30 gpm, while the other can deliver 60 gpm. When combined, these wells can deliver 129,600 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for four-bedroom houses, it is estimated the system has an existing demand of approximately 8,400 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

11. Turnbury Condominiums: Located off of Squamscott Road, this development currently consists of five three-bedroom, single family homes; however, a total of 72 houses have been approved and may yet be built. The president of the condominium association estimates the development's population at 15 people; however, once the development is fully built-out, the total population may be as high as 180 people. The water system consists of two bedrock wells, one is 500 feet deep while the other is 860 feet deep. Both wells can deliver 30 gpm. When combined, these wells can deliver 86,400 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses, it is estimated the development has an existing daily water demand of approximately 2,250 gpd; however, once fully-built out, the system's water demand may be as high as 32,400 gpd. Thus, the system's demand is well below its delivery capability, even after full build-out. The facility manager has not noted any water pressure or water quality problems as yet.

12. Smith Farm Condominiums: Located off of Smith Farm Road, this development consists of 13 three-bedroom, single family homes. The president of the condominium association estimates the development's population at 40 people. The water system consists of two bedrock wells, one is 140 feet deep while the other is 220 feet deep. One well can deliver seven gpm, while the other can

deliver 20 gpm. When combined, these wells have the capacity to deliver 38,880 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses, it is estimated the system has an existing daily water demand of approximately 5,850 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

13. Pheasant Run Condominiums: Located off of Portsmouth Avenue (Route 101), this development consists of 28 three-bedroom, single family homes. The president of the condominium association estimates the development's population at 80 people. The water system consists of two bedrock wells, one is 102 feet deep while the other is 107 feet deep. One well can deliver 27 gpm, while the other can deliver 35 gpm. When combined, these wells have the capacity to deliver 89,280 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses, it is estimated the system has an existing daily water demand of approximately 12,600 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

14. Stratham Woods Condominiums: Located off of Butterfield Road, this development currently consists of 10 three-bedroom, single family homes; however, an additional five units have been approved. The president of the condominium association estimates the development's current population at 30 people; however, the total could be as high as 45 residents once the development is fully built-out. The water system consists of two bedrock wells, both of which are 620 feet deep. One well can deliver 12 gpm, while the other can deliver 15 gpm. When combined, these wells can deliver 38,880 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses, it is estimated the system has an existing daily water demand of approximately 4,500 gpd. Once fully built-out, the system's water demand is estimated at 6,750 gpd. Thus, the system's demand is well below its delivery capability, even after full build-out. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

15. Aberdeen West: Located off of Willow Brook Road, this development currently consists of 18 two-bedroom, manufactured housing units; however, an additional five units have been approved. Using the person per household figure, the development's population is estimated at 45 people. Once the remaining five units are in place, the development's total population could be as high as 58 residents. The water system consists of two bedrock wells, one is 200 feet deep while the other is 260 feet deep. One well can deliver 17 gpm, while the other can deliver 18 gpm. When combined, these wells can deliver 50,400 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for two-bedroom houses, it is estimated the system has an existing daily water demand of approximately 5,400 gpd. Once fully built-out, the system's water demand is estimated at 6,900 gpd. Thus, the system's demand is well below its delivery capability, even after full build-out. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

16. Murrifield Cluster Development: Located off of Murrifield Drive, this development consists of 25 three-bedroom, single family homes. The president of the condominium association estimates the development's population at 70 people. The water system consists of two bedrock wells, one is 140 feet deep while the other is 320 feet deep. One well can deliver 24 gpm, while the other can deliver 30 gpm. When combined, these wells have the capacity to deliver 77,760 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for three-bedroom houses, it is estimated the system has an existing daily water demand of approximately 11,250 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand this development.

Non-Community Water Systems

1. Acorn School: Located off of Winnicut Road, this system serves the daily water needs of 65 students and ten staff people. The system consists of one bedrock well, which is 200 feet deep. The well can deliver 20 gpm, or 28,800 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for schools without cafeterias or showers (15 gpd per person), it is estimated the system has an existing daily water demand of approximately 1,125 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans at this time to expand the school.

2. Cornerstone School: Located off of High Street, this system serves the daily water needs of 110 students and 12 staff people. The system consists of one bedrock well, which is 175 feet deep. The well can deliver 60 gpm, or 86,400 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for schools without cafeterias or showers, it is estimated the system has an existing daily water demand of approximately 1,830 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are plans to build an addition to the school, however, the overall enrollment is not expected to increase.

3. Country Kids School: Located off of High Street, this system serves the daily water needs of 41 students and seven staff people. The system consists of one bedrock well, which is 220 feet deep. The well can deliver four gpm, or 5,760 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for schools without cafeterias or showers, it is estimated the school has an existing daily water demand of approximately 720 gpd. The system's demand appears to be well below its delivery capability, however, the facility manager has noted that pressure problems occur if one of the toilets gets stuck. No water quality problems have been noted as yet. There are no plans to expand the school at this time.

4. Memorial School: Located off of Gifford Farm Road, this system serves the daily water needs of 654 students and 50 staff people. The system consists of two bedrock wells, one is 100 feet deep while the other is 220 feet deep. One well can deliver 20 gpm, while the other can deliver 24 gpm. When combined, these wells can deliver as much as 63,300 gpd if pumped continuously over 24 hours.

The water is not metered, however, using the WSPCD design standards for schools with cafeterias and showers (35 gpd per person), it is estimated the system has an existing daily water demand of approximately 24,640 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans to expand the school at this time.

5. NH Technical College: Located off of Portsmouth Avenue (Route 101), this system serves the daily water needs of 900 students and 100 staff people. The system consists of one bedrock well, which is 550 feet deep. The well can deliver 18 gpm, or 25,920 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for schools with cafeterias but no showers (20 gpd per person), it is estimated the school has an existing daily water demand of approximately 20,000 gpd. Thus, the system's demand is slightly below its delivery capability. The facility manager has noted water pressure problems during periods of peak demand or when a toilet gets stuck. No water quality problems have been detected as yet. There are no plans to expand the school at this time.

6. Rockingham County Newspapers: Located off of Portsmouth Avenue, this system serves approximately 50 employees. The system consists of one bedrock well, which is 600 feet deep. The well can deliver 32 gpm, or 46,080 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for office buildings without a cafeteria (15 gpd per person), it is estimated the system has an existing daily water demand of approximately 750 gpd; well below its delivery capability. The facility manager has not noted any water pressure or water quality problems as yet. There are no plans to expand the facility at this time.

7. Stratham Town Offices: Located off of Bunker Hill Avenue, this system serves approximately 16 employees, most of whom are only there for a portion of the day. The facility is home for the Town's various municipal departments, with the exception of the Fire Department and the Public Works Department. There is also a kitchen which is used for special events. The system consists of one bedrock well, which is 150 feet deep. The well can deliver 20 gpm, or 28,800 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for office buildings with a kitchen (20 gpd per person), it is estimated the system has an existing daily water demand of approximately 320 gpd; well below its delivery capability. The Town has not noted any water pressure or water quality problems as yet. There are no plans to expand the municipal complex at this time.

8. Bell & Flynn Inc.: Located off of Bunker Hill Avenue, this system serves approximately 50 employees. The system consists of one bedrock well which is 160 feet deep. The well can deliver only two gpm, or 2,880 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for office buildings without a cafeteria, it is estimated the system has an existing demand of 750 gpd. The facility manager has detected water pressure problems when trucks are washed or when a toilet gets stuck. No water quality problems have been detected as yet. There are no plans to expand the facility at this time.

9. Piper's Landing: Located off of Portsmouth Avenue near the traffic circle, this system serves several professional offices with a total employee count of 20. The system consists of one bedrock well which is 440 feet deep. The well can deliver only six gpm, or 8,640 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for office buildings without a cafeteria, it is estimated the system has an existing demand of 300 gpd; well below its delivery capability. The facility manager has not detected any water pressure or water quality problems as yet. There are no plans to expand the facility at this time.

10. The Commons at Stratham Circle: Located off of Portsmouth Avenue near the traffic circle, this system serves several professional offices with a total employee count of 15. The system consists of one bedrock well which is 265 feet deep. The well can deliver 30 gpm, or 43,200 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for office buildings without a cafeteria, it is estimated the system has an existing demand of 225 gpd; well below its delivery capability. The facility manager has not detected any water pressure or water quality problems as yet. There are no plans to expand the facility at this time.

11. Shaw's Supermarket: Located at the southern end of Portsmouth Avenue, this system serves a grocery store with 250 employees. There is also a bank and a clothing store in the plaza. The system consists of two bedrock wells, one is 425 feet deep, while the other is 526 feet deep. The first well can deliver 10 gpm, while the second well can deliver 13 gpm. When combined, these wells can deliver 33,120 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for grocery stores (11 gpd per 100 square feet of building), it is estimated the system has an existing demand of 6,820 gpd; well below its delivery capability. The facility manager has not detected any water pressure or water quality problems. There are no plans to expand the facility at this time.

12. Demoula's Market Basket: Located off of the southern end of Portsmouth Avenue, this system serves a grocery store with 175 employees. There are also several small retail stores in the plaza. The system consists of two bedrock wells, one is 160 feet deep, while the other is 500 feet deep. The first well can deliver 15 gpm, while the second well can deliver 25 gpm. When combined, these wells can deliver 57,600 gpd if pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for grocery stores, it is estimated the system has an existing demand of 4,224 gpd; well below its delivery capability. The facility manager has not detected any water pressure or water quality problems as yet. There are no plans to expand the facility at this time.

13. King's Highway Plaza: Located off of Portsmouth Avenue, this system serves a department store with 100 employees. There are also several small retail stores and a sit-down restaurant in the plaza. The system consists of one bedrock well which is 190 feet deep. The well can deliver 150 gpm, or 216,000 gpd if pumped continuously over 24 hours. The system's existing water demand has been metered at 4,500 gpd; well below its delivery capability. The facility manager has not detected any water pressure or water quality problems as yet. There are plans to build a fast-food restaurant in the front of the

property. The restaurant is expected to add another 1,800 gpd of demand to the system. Thus, when the restaurant comes on line, the system's total demand will be 6,300 gpd; still well below its delivery capability.

Non-Community, Transient

1. Stratham Community Church: Located off of Emery Lane, this water system serves a small church with roughly 60 seats. The system consists of two bedrock wells, one of which is 70 feet deep while the other is 100 feet deep. The water delivery capability of the wells is unknown, however, the well owner has not detected any water pressure problems. The well owner estimates the system uses less than 100 gpd on average, however, this can increase to 500 gpd during church suppers and other events. No water quality data was available for this facility. There are no plans to expand the church.

2. Stratham Hill Park: Located along the northern section of Portsmouth Avenue, this water system serves a 108 acre municipal park. Significant features of the park include: a pavilion, a concert shell, a natural amphitheater, two baseball fields, toilet facilities and a large parking area. The water system consists of two bedrock wells, both of which are 80 feet deep. Both wells can deliver 30 gpm, or 86,400 gpd if pumped continuously over 24 hours. The water is not metered, however Town officials estimate the park's average daily water demand at less than 100 gpd although it can be as high as 5,000 gpd during large-scale public events such as the annual Stratham Fair. Thus, even at peak demand periods, the system is more than adequate to meet its existing demand. Town officials have not detected any water pressure or water quality problems as yet. There are no plans to expand the park at this time.

3. The Coop Restaurant: Located off of Portsmouth Avenue, this water system serves a small 30-seat restaurant. The system consists of one bedrock well, the depth of which is unknown. The well's water delivery capability is unknown, however, the restaurant manager has not detected any water pressure problems. The water is not metered, although using the WSPCD design standards for sit-down restaurants with toilet facilities (40 gpd per seat), the system's existing demand is estimated at 1,200 gpd. No water quality data was available for this site. There are no plans to expand the restaurant at this time.

4. Sweet Dreams Bakery: Located off of Portsmouth avenue, this water system serves a small bakery with no sit-down tables inside or outside the building. The system consists of one bedrock well, which is 320 feet deep. The well can deliver eight gpm, or 11,520 gpd if pumped continuously over 24 hours. The water is not metered, however, the bakery owner estimates the average daily water use at less than 100 gpd. The bakery owner has not detected any water pressure problems. No water quality data was available for this site. There are no plans to expand the bakery at this time.

5. Little Italy Restaurant: Located off of Portsmouth Avenue at the traffic circle, this water system serves a restaurant and an antique shop. The restaurant contains 50 sit-down seats and 34 lounge seats. Plans have also been approved to add a 30 seat bakery to the existing building and a golf driving range in the rear of the property. The system consists of one bedrock well which is 160 feet deep. The well can deliver 15 gpm, or 21,600 gpd if

pumped continuously over 24 hours. The water is not metered, however, using the WSPCD design standards for restaurants with lounges (40 gpd per restaurant seat, 20 gpd per lounge seat), the system's existing demand is estimated at 2,680 gpd. Once the bakery is established, the system's total demand will increase to 3,880 gpd. Thus, it appears the system is more than adequate to meet its existing and anticipated water demand. The owner has not detected any water pressure problems. No water quality data was available for this site.

Stratham Existing Water Demands

Table 6 below provides an estimate of the Town's existing water demands. The number of people served by on-site water wells was derived by taking the Town's total population and subtracting that portion served by the various community water systems. The water demand estimate for the population served by on-site wells is based on the WSPCD water demand estimate for three-bedroom units. This should yield a fairly liberal water demand estimate, for the design standards of the WSPCD are usually much higher than actual metered demands.

TABLE 6 - STRATHAM EXISTING WATER DEMANDS

Type of Water Supply	Population Served	Estimated and Actual Water Demand (gpd)
On-Site Wells*	3,429 people*	617,400 gpd#
Community Wells+	1,606 people+	211,200 gpd#
Non-Community Wells	2,625 students, staff and employees+	66,204 gpd#
Non-Community, Transient Wells	transient population not determined	9,480 gpd at peak demand#

Total Existing Water Demand Estimate for Stratham: 904,284 gpd

* = Population estimate based on 2.5 residents per household.
\+ = Population based on 2.5 residents per household, or estimate provided by condominium association/well owner.
\# = Water demand estimate based on WSPCD design standards/water meters/well owner estimates.

Stratham Future Water Demands

This section will use the most recent population projections developed by the NH Office of State Planning. For the year 2000, Stratham's population is projected at 5,992 residents; and for the year 2010, 7,522 residents are projected. In an effort to reasonably project the Town's future water demands, certain assumptions were made:

1. It is assumed that the various public water systems which have expansion plans (Winding Brook, Turnburry, King's Highway Plaza, etc.) will actually implement said plans. Thus, the water demand projections for these water systems will be based on the projects at full-build out.

2. Although new public water systems may be established in the future, it is impossible to project how much of the Town's overall water demand they will be responsible for. Therefore, the establishment of future public water systems will not be factored into the equation.

3. Once again, the number of people to be served by on-site water wells was derived by taking the Town's total population and subtracting the portion served by the various community water systems.

4. For the population to be served by individual water wells, their water demand projection will be based on the following formula: the population served by individual wells divided by the average persons per household figure (2.5) times the WSPCD design standard for three-bedroom residences (450 gpd).

5. As with the existing water demand estimates outlined in Table 6, the peak demands of the various water systems will be used.

With the above assumptions in mind, Table 7 below presents Stratham's projected water demands for the years 2000 and 2010.

TABLE 7 - STRATHAM PROJECTED WATER DEMANDS

Type of Water Supply	Water Demand Projection - Year 2000	Water Demand Projection - Year 2010
On-Site Wells	713,700 gpd	989,100 gpd
Community Wells	274,050 gpd	274,050 gpd
Non-Community Wells	68,004 gpd	68,004 gpd
Non-Community, Transient Wells	10,680 gpd	10,680 gpd
Total Projected Water Demands for Stratham:	**1,066,434 gpd**	**1,341,834 gpd**

The above water demand projections are general in nature, and are not intended as scientific data for the purpose of evaluating the need for a municipal water supply or any other detailed type of water planning effort. Rather, the projections are intended to be used only for general planning purposes. The water demand projections for on-site wells will no doubt be reduced due to the establishment of new community water systems throughout Town.

Public Wastewater Treatment Facilities

Currently, Stratham does not have a municipal wastewater treatment facility. The Town is entirely served by on-site septic systems and community septic systems, therefore, there has not been a need for a municipal wastewater treatment plant. The Town has no plans to install such a system within the planning period (approximately the ten years).

DESCRIPTION OF EXISTING PROGRAMS AND POLICIES

The local ordinances and regulations of the Town of Stratham were obtained and reviewed by Commission personnel for the purpose of identifying the elements of each which have the potential to impact water quality or quantity. The results of this review are summarized below.

Zoning Ordinance

In addition to the specific permitted uses described in the "Description of Potential Threats" chapter of this document, there are several other sections of the Stratham Zoning Ordinance which relate to water resources. These sections include:

1. The Table of Dimensional Requirements (Section 4.2 of the Zoning Ordinance) outlines a maximum building coverage requirement for all lots. This requirement ranges from 20% in the Residential/Agricultural district, to 40% in the General Commercial and Industrial districts. Limiting the amount of lot coverage helps to ensure the retention and percolation of stormwater on-site, thus helping to recharge aquifers and replenish on-site wells.

2. The Table of Dimensional Requirements outlines a minimum open space requirement for all lots. This requirement ranges from 60% in the Residential/Agricultural district, to 40% in the General Commercial and Industrial districts. This requirement helps to ensure that a lot's surface is not completely devoured by paved parking areas, storage areas, access ways, buildings, garages and other secondary structures.

3. Accessory apartments are allowed in Stratham upon the granting of a special exception by the Zoning Board of Adjustment (Section 5.4). One of the criteria for a special exception is the owner must prove the existing septic system meets the standards of the NH Water Supply and Pollution Control Division (WSPCD). The applicant must also prove there is adequate potable water for the site.

4. Stratham's cluster development provisions (Section 8 of the Zoning Ordinance) has several provisions which have the potential to directly or indirectly impact the Town's water resources. Chief among these provisions are:

   -- Cluster developments must have a minimum area of 20 acres for single family detached projects and 30 acres for attached dwelling unit projects; however, this total cannot include any poorly drained and very poorly drained soils, alluvial soils, waterbodies and land with slopes greater than 25%. Poorly drained soils are given credit up to the density computed for the non-wetland portion of the property. The overall computed density may then be increased by 2%.

   -- Cluster developments must set aside 25% of the total site for open space. Wetland soils cannot account for more than 50% of the land devoted to open space.

   -- Cluster developments with interior lot lines must provide each lot with a contiguous, non-wetland area of 20,000 square feet for single family homes, and 30,000 square feet for duplexes.

5. Stratham's Wetland Conservation District (Section 11) has several provisions which have the potential to directly or indirectly impact the Town's water resources. Chief among these provisions are:

   -- Permitted uses in areas containing poorly drained soils within the tidal marsh borders of the Squamscott River and Great Bay include: wildlife habitats, recreation areas, agriculture, forestry, conservation areas, water impoundments, drainage ways and any other use which does not involve the erection of a structure.

   -- Permitted uses in areas containing very poorly drained soils within the tidal marsh borders of the Squamscott River and Great Bay include those uses listed for poorly drained soils, as well as the construction of fences, footbridges, catwalks and wharves under certain conditions.

   -- Under certain conditions, the Planning Board may grant a Conditional Use Permit for the construction of roads, pipelines, powerlines and other transmission lines within the district.

   -- Septic systems must be located at least 50 feet away from poorly drained soils and 75 feet away from very poorly drained soils. Building activity is prohibited within 50 feet of poorly drained soils and 100 feet of very poorly drained soils.

6. Stratham's Shoreland Protection District (Section 12) has several provisions which have the potential to directly or indirectly impact the Town's water resources. Chief among these provisions are:

   -- The district consists of all land within 150 feet of the shoreline of the Squamscott River and Great Bay Estuary, including any adjacent tidal marsh land. The district also includes the areas within 100 feet of the seasonal high water level of all brooks and streams appearing on the USGS quadrangle maps.

   -- Permitted uses within the district include the following: agriculture, forestry, wildlife habitats, recreation areas, conservation areas, water impoundments and drainage ways. The construction of fences, footbridges, catwalks and wharves is permitted under certain conditions. The district also allows any use which does not involve the erection of a structure or the alteration of the land by dredging or adding fill, provided that a 75 foot buffer strip of natural vegetation along the Squamscott River, Great Bay Estuary and their associated tidal marshes, and 50 feet in width elsewhere, be maintained between the use and the shoreline.

7. Stratham's Aquifer Protection District (Section 13) has several provisions which have the potential to directly or indirectly impact the Town's water resources. Chief among these provisions are:

   -- Within the district, no more than 20% of a single lot or building site may be rendered impervious to groundwater infiltration. This lot coverage requirement may be exceeded if certain mitigation measures are installed, however, in no case shall the impervious lot coverage be allowed to expand beyond the Town's open space requirements for new lots.

-- To the extent feasible, all runoff from impervious surfaces shall be recharged to the aquifer on-site. For developments which exceed the 20% impervious surface limit, a plan must be provided for the retention and percolation of development generated stormwater, such that the post-development discharge volume to the aquifer is, at a minimum, equal to the pre-development discharge to the aquifer.

-- Prohibited uses within the district include: on-site disposal, bulk storage, processing or recycling of toxic or hazardous materials or wastes; underground storage tanks except as regulated by the State (tanks of 1,100 gallons or more); dumping of snow from off-site; automotive uses; laundry and dry cleaning businesses, and; industrial uses which discharge contact type wastes on-site.

-- Conditional uses within the district include: industrial and commercial uses not otherwise prohibited; multi-family residential development; excavation operations, and; animal feedlots under certain conditions.

-- Permitted uses within the district include: any use permitted by the underlying zoning district unless otherwise prohibited; maintenance and repair of existing structures, and; agricultural and forestry uses under certain conditions.

8. The Town's Floodplain Management District was adopted at the March 1989 Town Meeting. The ordinance is based on a model floodplain ordinance developed by the Federal Emergency Management Agency (FEMA). All proposed development within any special flood hazard areas requires a permit from the Town's Code Enforcement Officer. Permit applicants are required to furnish the Code Enforcement Officer with information regarding replacement septic systems, flood-proofing measures and engineering studies when the relocation of a watercourse is proposed. Development within the Town's identified flood hazard areas must comply with specific development standards, including elevation and flood-proofing requirements.

Subdivision Regulations

Stratham's Subdivision Regulations contain specific provisions which pertain to the management and protection of water resources. Chief among these provisions are the following:

1. Poorly drained soils may be utilized to fulfill 25% of the minimum lot size requirement. Marsh lands, very poorly drained soils and alluvial soils cannot be utilized to fulfill the minimum lot size requirement (Section 4.3.1, Item b-1 and b-2).

2. Septic systems cannot be located closer than 75 feet of a poorly drained soil, and 100 feet of a very poorly drained soil. Wetlands cannot be filled for the purpose of providing the minimum distance between the septic system and the wetland (Section 4.3.1, Item b-3 and b-4). Obviously, the first provision is in direct conflict with the provisions of the Town's Wetland Conservation District.

3. In addition to the minimum lot sizes outlined in the Zoning Ordinance, the Town utilizes soil-based lot sizing standards in order to establish lot sizes which are compatible with the proposed septic loading (Section 4.3.4). Stratham's soil-based lot sizing standards are based on the Model Subdivision Regulations for Soil-Based Lot Size, prepared in 1991 by the NH Department of Environmental Services and the Rockingham County Conservation District.

4. Section 4.4.6 gives the Planning Board the power to require engineering studies on the effect of a subdivision on existing downstream drainage facilities outside of the subdivision's boundaries. The Board can require the provision of easements, water retarding facilities and other improvements when it is determined that the development's additional run-off will overload or significantly increase the demand on a downstream drainage facility.

5. Although Stratham does not have a municipal water system or a Town Engineer, Section 4.4.7 reads as follows:

> "All subdivisions and developments shall provide municipal or community water service when available or required by the Planning Board. Installation of all water mains is subject to the approval of the Town Engineer."

This provision is not necessary since Stratham has neither a municipal water system or a Town Engineer. Any engineering review work for the Planning Board is contracted out to a consultant.

6. All newly created lots must comply with the standards of the WSPCD. Newly installed septic systems must also comply with the standards of the WSPCD, although septic systems which handle over 2,000 gallons per day must also be designed by a professional engineer licensed in New Hampshire (Section 4.4.11, Item a).

7. Regarding the placement of on-site septic systems, the Subdivision Regulations contain several standards which are more stringent than the State's. These provisions, as outlined in Section 4.4.11, include the following:

   -- The Town requires two feet rather than six inches of natural permeable soil above the seasonal high water table.

   -- Five feet of natural soil is required above bedrock or any impervious substratum.

   -- The Planning Board may require a "groundwater mounding analysis" for septic systems designed for 2,400 gallons per day or greater.

   -- The Town requires that all newly created lots have a septic reserve area of 5,000 square feet rather than the 4,000 square feet required by the State.

8. Section 4.4.11, Item b gives the Planning Board the power to require a hydro-geological study for developments with septic systems designed for 2,400 gallons per day, as well as for any development project located within the Town's stratified drift deposits.

9. Septic systems cannot create groundwater degradation beyond the limits of the property line in excess of EPA water quality standards for domestic water supplies (Section 4.4.11, Item b).

10. Section 4.4.13 (Flood Hazard Areas) contains the model language for subdivision regulations suggested by the Federal Emergency Management Agency (FEMA). This section includes provisions dealing with permits, minimization of flood damage, elevation and flood-proofing records, alteration of watercourses and floodplain delineation.

11. Section 4.4.14 requires an erosion and sediment control plan for projects where the cumulative disturbed area will exceed 20,000 square feet, where a road is planned, where three or more building lots are proposed, and where critical areas will be disturbed. The Town's erosion and sediment control standards are based on the most recent "Guide for Erosion and Sediment Control" as adopted by the Rockingham County Conservation District.

12. Where a subdivision is traversed by a watercourse, drainage way, channel or stream, the Planning Board may require a stormwater easement or a drainage right-of-way of at least 25 feet in width (Section 4.4.15, Item b).

13. Section 4.5.2 requires that all areas of a subdivision be graded to prevent flooding and erosion. In addition, storm sewers and other drainage facilities must be connected to an adequate outfall. The drainage system must be separate from the sewer system, and drainage improvements may be required along any existing streets adjacent to the subdivision. The section goes on to require different storm frequency designs for different types of drainage facilities.

14. Section 4.5.3 outlines standards for municipal water main connections and fire hydrant installation. Since Stratham does not have a municipal water system, these provisions are not necessary.

<u>Site Plan Review Regulations</u>

Stratham's Site Plan Review Regulations contain specific provisions which pertain to the management and protection of water resources. Chief among these provisions are the following:

1. Section 5.3 requires that an adequate stormwater drainage system be provided, and drainage must be carried to existing drainage facilities or watercourses. New drainage ways cannot be created unless easements are obtained. In addition, no increase in runoff is permitted if said runoff passes beyond the property lines unless it is to be within an existing approved public storm drainage system.

2. Section 5.4 outlines several provisions dealing with flood control, such as utilities must be installed and drainage provided to reduce their exposure to flood hazards, and the site must be designed to minimize flood water infiltration into water supplies and septic systems, and discharges from these systems into flood waters.

3. Section 5.10 reads as follows:

> "In areas of the Town where municipal water and sewer service is not provided, water supply and sewage disposal systems must be sized to meet the needs of the proposed use. Percolation tests and design of disposal systems shall comply with the Town of Stratham Subdivision Regulations and all applicable State standards and regulations."

4. The erosion and sediment control provisions of the Site Plan Review Regulations (Section 5.12) are exactly the same as those outlined in the Subdivision Regulations.

Building Code

Stratham has a Code Enforcement Officer who enforces the Zoning Ordinance, Building Ordinance and the most recent version of the BOCA National Building Code as published by the Building Officials and Code Administrators International, Inc. The Town also requires permits for the installation of electricity, plumbing, heating, and gas.

Health Ordinance

Stratham does not have a formal "health" ordinance, however, the Town's Code Enforcement Officer is charged with enforcing the local ordinances and regulations relating to the construction, location and maintenance of on-site septic systems, although the Town's Health Officer does get involved in certain circumstances. The Health Officer is responsible for enforcing the State's regulations pertaining to septic systems and water quality standards in accordance with RSA 147.

SUMMARY OF LOCAL REGULATORY EFFORTS

The following discussion summarizes which local ordinances and regulations have the potential to impact specific water resource concerns, including: sedimentation and erosion control, surface water flows and drainage, groundwater recharge, managing existing and potential contaminants, flood storage, wetland encroachment, nutrient levels, plus wildlife and fisheries.

1. **In terms of sedimentation and erosion control** - The grading, drainage, and erosion control measures of the Subdivision Regulations and Site Plan Review Regulations are helpful in this respect. However, these provisions are arranged in a piecemeal fashion and cannot be applied consistently throughout both the subdivision and site plan review processes. Provisions outlined in one set of regulations are not found in the other, and visa versa.

   Erosion can degrade water quality through the introduction of excessive sediments into surface waters. This can increase the water's turbidity and the intensity of biological activity, as well as displace oxygen within the water.

2. **In terms of surface water flows** - The various drainage and grading provisions of the Subdivision Regulations and Site Plan Review Regulations are helpful in controlling the amount of surface water generated on a building site by channeling it in an environmentally safe manner. Once again, the piecemeal nature of the provisions dilute their effectiveness. The drainage provisions within the Town's regulatory framework should be amended to provide more clarity and consistency.

Problems associated with excessive surface water flows are flooding (in some cases), the transportation of pollutants into nearby surface water holding areas, plus erosion and sedimentation.

3. **In terms of groundwater recharge** - The lot coverage requirements of the Town's Zoning Ordinance (particularly the Aquifer Protection District) are quite helpful in this regard. Limiting a lot's impervious surface coverage results in leaving a substantial amount of open land which can be permeated by precipitation, which in turn recharges the aquifer. The drainage and grading provisions of the Town's Subdivision and Site Plan Review Regulations are also helpful in terms of ensuring that surface water runoff is handled on-site as opposed to forming a sheet flow of water heading down-gradient.

4. **In terms of managing existing and potential threats** - All of the Town's environmental protection districts prohibit high risk land uses within sensitive environmental areas. The Town's strict enforcement of the WSPCD septic system installation standards is also of benefit in this regard. The Town's soil-based lot sizing requirements help to ensure that newly created lots are large enough to handle the wastewater generated on-site.

5. **In terms of flood storage** - The grading, drainage, erosion control and flood protection provisions of the Town's Subdivision Regulations and Site Plan Review Regulations help to maintain flood storage capability by reducing and controlling the amount of surface water runoff which could eventually drain into the Town's surface waters, thus contributing to the overburdening of the floodplain. The construction standards set forth in the Town's Floodplain Development Ordinance are also of benefit. No regulatory changes are suggested here.

6. **In terms of wetland encroachment** - The provisions of the Wetland Conservation District and the Shoreland Protection District are helpful in terms of protecting the integrity of wetland soils. The protective buffer required between a wetland and construction activity helps to minimize wetland disturbance which can happen when development activity takes place in close proximity to wetlands. The permitted uses of both the Wetland Conservation District and the Shoreland Protection District are of the passive variety, thus helping to ensure the integrity of these sensitive resources.

7. **In terms of nutrient levels** - Stratham does not have any specific ordinances or regulations which deal with this issue. However, in an indirect manner, the drainage and erosion control provisions of the Subdivision Regulations and Site Plan Review Regulations do help to control nutrient levels by reducing the amount of surface water runoff leaving a site during the construction phase. Excessive surface water flows carry nutrients across the land into surface waters, thus exacerbating the problems associated with nutrient overloading.

8. **In terms of wildlife and fisheries** - The Town does not have any specific regulations or ordinances which deal with these issues. Any existing impacts on wildlife and fisheries within Stratham are an indirect result of the Town's regulatory efforts. No regulatory changes are proposed in this regard.

ANALYSIS

Analysis Regarding Water Supply

A detailed discussion of the Town's existing water demands and projected water demands is presented in the "Description of the Infrastructure" chapter of this document. Based on this discussion, it appears the majority of the Town's existing public water systems are more than adequate to meet their existing demands, and could serve a substantial amount of future development within the planning period (approximately ten years). Based on the Town's projected water demands for the next ten years, the establishment of new water sources for a municipal water system will not be necessary. The Town's bedrock and till areas currently provide water for the majority of Stratham residents and should continue to do so well into the future. In addition, the Town's aquifer resources have not been substantially utilized for the purpose of supplying water, although the capability does exist.

Analysis Regarding Other Water Resources and Purposes

Items addressed below include: groundwater and surface water discharges, recreation, wetlands protection, fisheries, wildlife, hydropower, fire protection, and conflicts among competing uses.

1. **Groundwater and surface water discharges** - As mentioned in the previous chapters, there are no major surface water discharges taking place in Stratham. However, there are three discharges taking place outside of Stratham which impact on the Town's surface waters. These discharges include: the Exeter and Newfields municipal wastewater treatment plants which discharge to the Squamscott River, and the Newmarket wastewater treatment plant which discharges to the Lamprey River. Although the Lamprey River is not located within Stratham, it is part of the Great Bay estuarine system. Tidal waters from this system flow into Stratham during periods of high tide. The previously cited 1988 WSPCD 305(b) Water Quality Report identified the Squamscott River as "not supporting" its class B legislative classification. Stratham should work with the other communities along the Squamscott River and the Great Bay to develop a coordinated and effective water quality enhancement strategy.

   There is one holder of a Groundwater Discharge Permit in Stratham. The permit belongs to the Turnbury Condominium residential development. It allows the development's septic system to discharge as much as 30,000 gpd of wastewater into the ground. This development is not fully built-out and currently only discharges 2,250 gallons of wastewater per day. The septic system is located in a bedrock and till area. There are five other major groundwater discharges which do not have a Groundwater Discharge Permit from the State. These discharges are from large, residential septic systems which were installed prior to the establishment of the State's groundwater accounting system. Of these five discharges, only one is located above an identified aquifer while the remainder are located in bedrock and till areas.

   In the future, Stratham's reliance on community septic systems and individual, on-site septic systems may result in the need to evaluate the land's capacity to assimilate wastewater. It is unlikely this need will arise within the planning period (approximately the next ten years).

2. **Recreation** - The Squamscott River and Great Bay are the most suitable waters for boating. Canoeing is particularly popular along the Squamscott River. Stratham has two public access areas: Chapman's Landing along College Road (owned by the NH Fish and Game Department), and the Town Landing at the end of River Road. Stratham's streams and rivers are used also used for fishing, swimming and skating.

   The NH Coastal Program has plans to build an interpretive environmental education center at a site along Depot Road. Although the majority of the site is located in Greenland, access will be derived from Stratham. An adjoining trail system and a boardwalk fronting on the Great Bay's salt marshes have been built as part of the center. Construction of the center has begun and a grand opening is scheduled for late 1993 or early 1994.

3. **Wetland protection** - Adopted at the March 1983 Town Meeting, the Stratham Wetland Conservation District contains numerous provisions aimed at wetland protection. The most significant provisions include prohibiting certain high risk land uses, limiting the number of permitted uses, requiring a protective buffer between wetlands and development activity, as well as septic system placement standards.

4. **Fisheries** - All of the Town's waterbodies and watercourses are suitable for fishing. During the winter months, the Squamscott River is dotted with ice fishing shacks. In addition, the Town's major watercourses are stocked with a variety of fish supplied by the NH Fish and Game Department. The Squamscott River is stocked with heron, smelts, bluebacks and american shad; the Winnicut River is stocked with brook trout, rainbow trout and brown trout; and finally, Jewett Hill Brook is stocked with anadromous fish. Mill Brook and Parkman Brook have also been stocked in the past.

5. **Wildlife habitat** - River, stream, floodplain and wetland corridors provide the richest habitat for the greatest number of fish, wildlife and flora. Fish and wildlife populations cannot survive beyond their range, and waterfowl and other birds need ground-level nesting habitat. Protection of these linear corridors is essential to the stability of wildlife populations.

   Riparian corridors like shorelands also provide a range of recreational benefits like canoeing, hiking, fishing, birding, horse trails, cross-country skiing, and picnicking. Shorelands are environmentally sensitive areas due to their susceptibility to flooding, erodibility and proximity to open water. Moreover, soil type and the slope of the land typically limit the development potential of shorelands.

   As mentioned previously, the tidal Squamscott River falls within the federally designated Great Bay Estuary. This area provides prime habitat for many wildlife species. According to the 1981 NH Fish and Game Department Study, Inventory of the Natural Resources of the Great Bay Estuarine System, more than 90,000 birds reside in the estuary. Thousands of geese and black ducks rest and feed in the estuary during autumn months. Osprey are common during the spring and fall migration cycles. There are three rare and endangered wildlife species which live in the estuary: the bald eagle, common tern and the common loon.

Terrestrial mammals which use the Great Bay estuarine system include: raccoons, white tail deer, red fox, woodchuck, muskrats, chipmunks, grey squirrels, cottontail rabbits, mink, otter, beaver and other species. A complete inventory of all animals and plants which reside in the estuary can be found in the in NH Fish and Game study cited above, as well as in the Great Bay National Estuarine Research Reserve Management Plan, prepared by the NH Office of State Planning in 1989.

6. **Hydropower** - Currently, the Town does not utilize any portion of its water resources for hydropower production, nor does it have any plans to do so within the planning period (approximately ten years).

7. **Fire protection** - The Town's fire station is located off of Winnicut Road near the traffic circle. The Fire Department is staffed by a part-time Fire Chief and roughly 100 volunteers. The department participates in the Inter-State Emergency Unit mutual aid program which is composed of 54 communities in New Hampshire, Maine and Massachusetts.

   In terms of equipment, there are two combination tanker-pumper trucks; the first can pump 1,000 gallons per minute (gpm), while the second can pump 1,000 gpm. Both trucks have tanks which can hold 1,000 gallons of water. The department also has one large tanker truck which can hold 3,000 gallons of water and is equipped with a pump that can deliver 1,250 gpm. The tanks are filled with water from the numerous fire ponds scattered throughout Town. Many of these fire ponds have dry hydrants in close proximity.

8. **Conflicts** - The major water-related conflict is the various uses of the Squamscott River. The River is used as a point of discharge for the Exeter and Newfields wastewater treatment plants, it is used by boaters and fishers in the summer and ice fishermen in the winter, and it is home to a variety of fish, bird and other wildlife species. As mentioned previously, the River currently does not meet the legislative Class B water quality standards. There are times where the estuary's clam flats are closed to the taking of shellfish because of high fecal-coliform counts. Stratham needs to work with other communities along the river and estuary in order to implement a coordinated strategy for improving water quality.

Management of Potential Threats

The "Description of Potential Threats" chapter enumerates the Town's existing potential threats, plus the potential threats posed by the current zoning scheme. Stratham has a number of business which pose potential threats to water resources due to their storage, use and disposal of hazardous substances. For these establishments, the proper storage, use and disposal of potentially hazardous substances should be the Town's primary focus, whether through regulatory or non-regulatory efforts.

An example of a non-regulatory education effort would be to provide the owners of potentially hazardous land uses with a copy of the State's administrative rules (Env-Ws 421) which govern Best Management Practices (BMPs). BMPs are common sense storage, use and disposal practices for hazardous substances. The State's BMP rules are currently in effect throughout New Hampshire, however, many owners of potentially hazardous land uses are unaware of their existence.

In terms of regulatory approaches, the Town could implement a BMP compliance inspection program for existing and proposed potentially hazardous land uses, either as part of a health ordinance or as part of its Wellhead Protection Program. For new potentially hazardous land uses wishing to locate in Stratham, perhaps the Planning Board could require BMP compliance, as well as a periodic BMP compliance inspection, as a condition of approval. An inspection schedule could be arranged by the Town's Code Enforcement Officer, Health Officer or any other local official duly appointed by the Selectmen. BMP compliance and/or inspections could be required as a condition of an occupancy or building permit.

Another way to deal with potentially hazardous uses currently allowed by right would be to reclassify such uses as special exceptions within the Zoning Ordinance. This would allow the Planning Board to establish specific performance standards that potentially hazardous land uses would have to comply with in order to obtain a special exception from the Zoning Board of Adjustment. BMP compliance could be listed as one of the performance standards.

RECOMMENDATIONS FOR REVISED PROGRAMS AND POLICIES

In an effort to protect and wisely manage the water resources of Stratham, the Town can pursue a number of regulatory and non-regulatory strategies. Reliance on a single method is not advised. Rather, it is recommended the Town use a combination of strategies. The following recommendations should not lead one to believe that every single suggestion needs to be implemented, rather, the items described below are an attempt to provide the Town with a variety of options for protecting and managing its water resources in a sound, rational manner.

Non-Regulatory Programs

1. The Stratham Public Works Department's salt spreaders should be calibrated to minimize the potential contamination of water resources during winter road maintenance efforts. Salt spreaders can be calibrated as part of routine maintenance at no additional cost to the Town. Many New Hampshire communities go as far as to prohibit the use of road salt above critical resource areas. In such cases, the road crew brings along a quantity of sand when they begin a road salting effort. Once over a critical resource area, the salt spreaders are turned off and the roads are sanded. Signs are posted along the roads to mark the beginning and end of no-salt areas.

2. The Town should continue to participate in any regional or inter-community household hazardous waste collection programs. Since the Rockingham Planning Commission decided to suspend its household hazardous waste collection program due to cost considerations, opportunities for household hazardous waste disposal have been infrequent in the region; in many cases, a citizen only has one opportunity per year to dispose of household hazardous wastes. Stratham has already participated in one inter-community, household hazardous waste collection day; this was in October of 1992, in conjunction with the Town of Exeter.

   Citizens of New Hampshire still have a hard time finding places to dispose of their household hazardous wastes. Collection days are infrequent; if a citizen misses the appointed day (or the site is too crowed, which is often the case), then the hazardous materials must be taken home until the next disposal opportunity, which may be far off in the future.

Since the State's effort to resolve the household hazardous waste disposal problem has been minimal, the Town needs to take a more pro-active course of action, either on its own or as a member of the Lamprey Regional Solid Waste Cooperative. Perhaps the Cooperative's communities could arrange to have a space within each town's transfer station or solid waste disposal site where citizens could drop off their household hazardous wastes for proper disposal at a later date. Another option would be for the Cooperative to establish a regional household hazardous waste drop-off site. This would vastly increase a citizen's options for disposal of such wastes, even if this site were open only one day a week or one day a month. In the meantime, the number of household hazardous waste collection days need to be increased and the Town is encouraged to work towards this end.

3. Education programs on the proper storage and disposal of household hazardous waste materials should be considered by the Town. The pamphlet entitled, "Hazardous Materials in Your Home", prepared by the University of New Hampshire Cooperative Extension Service in conjunction with the Governor's Energy Office, is something which could be distributed on a Town-wide level. Perhaps sending the pamphlet along with property tax bills would be the most feasible option of distribution. For more information please contact the local Cooperative Extension Office in Brentwood.

4. The Stratham Conservation Commission should continue to work with owners of properties containing environmentally sensitive lands and critical water resources to obtain such areas by gift, grant, or bequest, and/or obtain covenants or easements. This is a great way to protect environmentally sensitive lands at minimal cost to the community in terms of tax dollars. It is possible the only costs associated with land protection efforts involving gifts, grants, bequests, and the establishment of covenants and easements would pertain to survey, legal, and recording fees.

   In addition, Stratham should work with the State's various semi-public and regional land acquisition organizations such as the Society for the Protection of NH Forests, NH Audubon Society, and the Rockingham Land Trust. As may be appropriate in certain circumstances, the Conservation Commission should consider including in the Capital Improvements Program recommended funding for acquiring land containing critical resources.

5. The Town should consider developing an assistance program for the removal of underground storage tanks. Perhaps a pamphlet could be published which addresses the following items: tank placement, removal and replacement, tank construction, leak detection methods, and a description of the state program which offers limited financial assistance for tank removal and contamination remediation. The Town should coordinate this effort with the Groundwater Protection Bureau of NHDES. At a minimum, the pamphlet entitled "Here Lies the Problem...Leaking Underground Storage Systems", prepared by the EPA and the New England Water Pollution Control Commission, should be distributed with the Town's property tax bills. This pamphlet describes the various types of underground storage tanks, monitoring and leak detection equipment. In order to obtain this pamphlet, please contact the Rockingham Planning Commission in Exeter.

6. A pamphlet on the proper maintenance of septic systems and leachfields has been prepared by the Granite State Septic System Designers and Installers Association in concert with the University of New Hampshire Cooperative Extension Service. The most feasible option for distribution would be to have the Town's Code Enforcement Officer distribute the pamphlet when inspecting new or replaced septic systems. For more information please contact the local Cooperative Extension Service in Brentwood.

7. The municipal school system should consider instituting a "Stream Study and Water Quality Assessment Curriculum". This program can be set up with assistance from the Biology Bureau of the NH Department of Environmental Services. The program is designed for grades five through eight, and involves indoor classroom activities and outdoor field observations. Aspects of the program include stream monitoring, water quality testing and water resource protection methods. For more information please contact the DES Biology Bureau in Concord.

8. The municipal school system should consider instituting the "Discovering Spring Wetlands" curriculum designed by the Nongame Wildlife Program and the Outdoor Education Unit of the NH Fish and Game Department. The program is designed for fourth and fifth grade students, and involves indoor and outdoor activities relating to wetlands education. For more information, please contact the Information and Education Division of the NH Fish and Game Department in Concord.

9. The Conservation Commission should research what types of vegetation are suitable for shoreline planting. This information could be put into the form of a flyer or pamphlet, and could be distributed to shoreline property owners. In terms of erosion control, the right type of vegetation can be critical. For more information on suitable vegetation types, please contact the DES Biology Bureau.

10. In an effort to stay informed on the larger picture of overall watershed development, Stratham planners should monitor development activity taking place within the watersheds which it shares with neighboring communities and participate in any watershed-wide protection efforts. Monitoring development activity within the watersheds could be achieved by simply obtaining the Planning Board agendas of the other watershed communities. In turn, the Stratham Planning Board could send its monthly agendas to the Planning Boards of other watershed communities. In addition to keeping the Stratham Planning Board informed on development activity within its watersheds, this process will go a long way towards inspiring inter-community communication and cooperation. Reviewing the Planning Board agendas of neighboring watershed communities could be a regular monthly agenda item for the Stratham Planning Board.

11. Citizens owning land along the banks of the Squamscott River should be encouraged to form a river protection organization similar to the Exeter River Watershed Association. The organization would be comprised of citizens from the communities having frontage on the river: Stratham, Newfields, Exeter and Newmarket.

12. The State's Groundwater Protection Act (RSA 485-C) identifies land uses which are considered potentially hazardous to groundwater resources. In order to ensure that such uses employ proper practices for the storage, use and disposal of hazardous substances, the NH Department of Environmental Services has developed a set of administrative rules (Env.Ws 421) which set forth required Best Management Practices (BMPs) for hazardous land uses. The BMPs are common sense storage, use and disposal practices for hazardous substances. BMP compliance is required throughout the State.

    The Town is currently reviewing management plan options for its Wellhead Protection Program. One of the options being considered is a non-regulatory BMP education program. If this option is selected, the Town would distribute the State's BMP rules to all of the Town's existing potentially hazardous land uses, as well as to any potentially hazardous land use which plans on locating in Stratham. For new uses, the BMP administrative rules could be distributed as part of the building or occupancy permit processes.

13. In addition to the State's BMP rules for handling hazardous substances, the Soil Conservation Service has prepared a set of BMPs for farming operations and pesticide users. These BMPs cover manure storage and application, pesticide storage and application, animal feedlots, and soil conservation measures. For more information on these agricultural BMPs, please contact the local Soil Conservation Service office in Exeter.

14. The Planning Board should keep in close contact with the Rockingham Planning Commission in order to keep the water plan's inventory information up-to-date. The Board should periodically consult the with Commission on what new data sources to incorporate into this document, as well as use the Commission as an information source on new developments concerning water resource issues and planning.

The costs of putting these non-regulatory programs in place are expected to be variable, and in some cases, not possible to estimate at this time without further investigation. It is quite possible the Rockingham Planning Commission could provide technical assistance on the implementation of the above recommendations.

Any water resource protection effort worth pursuing will require the commitment of human and financial resources. It is recommended the Town make full use of interested civic groups and other volunteers as a cost effective means of enacting the suggested non-regulatory programs. It should not be necessary for the Town to hire additional personnel to conduct or oversee any of the above recommendations.

Regulatory Programs

The Town of Stratham enforces a Zoning Ordinance which deals with a variety of water resource issues such as: wetland protection, shoreland protection, floodplain protection and aquifer protection. The Town also enforces Subdivision Regulations, Site Plan Review Regulations, a Building Code, septic system health standards, and specifications for the installation of roadways and utilities.

The following pages contain several regulatory actions which are recommended as a means of improving or enhancing the Town's water resource management and protection efforts.

1. From July of 1992 to the present, the Town has been developing a Wellhead Protection Program as authorized by the State's Groundwater Protection Act (RSA 485-C). Thus far, the following tasks have been completed:

   -- The locations of the wells which constitute the Town's 34 active pubic water systems have been identified and mapped, using a combination of Global Positioning System satellite mapping and a tape and compass.

   -- The surface and subsurface areas surrounding the Town's 34 public water systems which contribute water to their wells have been identified. The contributing surface and subsurface area is referred to as the Wellhead Protection Area or WHPA.

   -- All existing potential pollution sources within the previously identified WHPAs have been identified and mapped using a tape and compass.

   The Town is currently reviewing several options for the Wellhead Protection Program's management plan. Three of the management plan options are regulatory in nature. Of the three regulatory options, two deal with reclassifying the Town's groundwater resources. Under the Groundwater Protection Act, the State's groundwater resources are broken down into four water quality classifications, much like the State Legislature's surface water quality classifications of A, B or C. Currently, Stratham's stratified drift aquifers, as mapped by the USGS, are classified as GA2 groundwater resources. All other areas of the community are classified as GB groundwater resources.

   Stratham has the option of upgrading the classification of its groundwater resources to either Class GA1 or Class GAA. The difference between the two is that with a GAA classification, the Town could place an outright prohibition on several highly hazardous land uses, such as landfills, septage lagoons, salt piles, etc. It should be noted that most of the prohibited hazardous land uses that accompany a GAA classification are already prohibited throughout Stratham. If the Town chooses to pursue either of the groundwater reclassification options, it would need to actively inspect all of its potentially hazardous land uses for BMP compliance.

   If Stratham does reclassify its groundwater resources, no changes need to be made to the Town's regulatory framework, rather, the Town is automatically empowered to enforce the State's BMP administrative rules. However, if the Town wanted to charge either the potential threat owners or the public water systems for the cost of the BMP compliance inspections, a local Health Ordinance would need to be adopted which contained a provision dealing with inspection costs.

2. The third regulatory option for the management plan of the Town's Wellhead Protection Program is the adoption of a local health ordinance. In this case, the Town would adopt a health ordinance which would reserve the right of the Town's Code Enforcement Officer or Health Officer to conduct a BMP compliance inspection when a problem is suspected. The health ordinance could encompass several other health-related issues such as septic system installation, maintenance and replacement standards. As a management plan option for the Town's Wellhead Protection Program, such an ordinance would be quite easy to adopt. A health ordinance, unlike zoning amendments, could be adopted by the Board of Selectmen any time during the year after a public hearing.

3. Short of reclassifying its groundwater resources or adopting a health ordinance, the Town has several other regulatory options for BMP compliance. Among these options are the following:

   -- The potentially hazardous land uses which are currently listed in the Zoning Ordinance as permitted uses could be reclassified as special exceptions. The criteria for a special exception could include compliance with the State's BMP administrative rules, among other possible performance standards. A BMP compliance inspection program could also be listed under the special exception criteria.

   -- If the Planning Board does not want to reclassify the potentially hazardous land uses permitted by right, it can require BMP compliance, as well as a BMP compliance inspection program, as a condition of approval for development proposals involving potentially hazardous land uses. If this option is chosen, the Site Plan Review Regulations should be amended to give the Planning Board the power to require BMP compliance and/or periodic BMP compliance inspections for potentially hazardous land uses as a condition of approval. This power should be discretionary, only to be invoked by the Planning Board when deemed appropriate.

   -- Lastly, the Town could establish a policy which would require an applicant for a building permit or an occupancy permit to demonstrate BMP compliance prior to the issuance of the permit. Of course, this requirement would only apply to those potentially hazardous land uses described in the State's Groundwater Protection Act.

4. In 1992, the State Legislature passed the Comprehensive Shoreland Protection Act (RSA 483-B), although due to funding problems, the State is only enforcing three of the Act's provisions. Once fully funded, the law will be enforced in its entirety. In an effort to help New Hampshire communities comply with RSA 483-B, the NH Office of State Planning has developed a model shoreland protection ordinance. This model includes all of the law's provisions, not just the handful currently enforced by the State. Stratham planners should compare the State's model shoreland protection ordinance to the Town's existing Shoreland Protection Ordinance in order to see if modifications are necessary. The Town is allowed to have stronger provisions than the State model, however, the Town cannot lessen the provisions of the law which are already in place and being enforced. The three provisions of the New Hampshire Shoreland Protection Act which are currently enforced are:

   -- All newly created lots having shoreland frontage shall receive State Subdivision Approval from the Water Supply and Pollution Control Division (WSPCD) of the NH Department of Environmental Services. Prior to the Act's adoption, newly created shoreland lots of five acres or more were exempt from the need to obtain State Subdivision Approval.

   -- All new development projects having shoreland frontage need to obtain a Site Specific Permit from the WSPCD if the proposal calls for disturbing more than 50,000 square feet of land. Prior to the Act's adoption, new development projects having shoreland frontage were allowed up to 100,000 square feet of land disturbance before a Site Specific Permit was required.

-- New and replacement septic systems for lots having shoreland frontage must be setback 75 feet to 125 feet (depending on the nature of the soil) from a waterbody or watercourse. Prior to the Act's adoption, new and replacement septic systems for lots having shoreland frontage had to be setback 50 feet to 75 feet from a waterbody or watercourse. For this provision, New Hampshire communities are allowed to have setback standards which are more strict than those of the Act.

For more information on this subject, please contact the Rockingham Planning Commission, or obtain the "Model Shoreland Protection Ordinance" prepared by the NH Office of State Planning.

5. The Town should amend its Subdivision Regulations and Site Plan Review Regulations to require a detailed water supply study for proposed community water systems and large public water systems, as well as for existing large public water systems wishing to expand. For the expansion of existing systems, simply reviewing the well yield data versus the expected increase in water demand should be sufficient. As part of such a study, the Board could ask that the following items be addressed:

-- The well's water quality;

-- The water system's overall impact on the aquifer's rate of recharge;

-- The well's water delivery capability, and;

-- Secondary impacts such as:

  -- The potential for de-watering adjacent wetlands;

  -- Potential affects on the surrounding water table;

  -- Potential changes to the base flows of adjacent watercourses, and;

  -- Potential affects on existing water wells within the area.

6. A review of Stratham's history of groundwater contamination by underground storage tanks, as well as a review of the Town's existing regulatory structure, indicates that stronger provisions are needed. Several regulatory changes are recommended:

A. The Zoning Ordinance should be amended to require the placement of storage tanks comply with relevant setback requirements (especially the setbacks for wetlands, shorelands and floodplains). This provision should apply to the majority of tanks (certainly those having capacities of 40 gallons or more). Tanks located in basements having an impervious floor should be exempt.

B. The Site Plan Review Regulations should be amended to require that applicants indicate the locations of all proposed storage tanks on their site plans, whether above ground or underground.

C. Underground storage tanks, even those regulated by the State (1,100 gallons or more), should be prohibited as part of the Town's Aquifer Protection District. An exemption should exist for fuel storage tanks located in basements having an impermeable floor surface.

D. For development projects proposing to use underground storage tanks, the Planning Board should require a monitoring program and the periodic testing of monitoring equipment as a condition of approval.

E. In an effort to aid the Stratham Fire Department, the Site Plan Review Regulations should be amended to require applicants to clearly mark the contents of all above ground storage tanks having capacities of 40 gallons or more. This should cover the majority of above ground tanks, while exempting the small tanks associated with outdoor barbecue units.

7. Sections 4.4.6, 4.4.15 - Item b, and 4.5.2 of the Subdivision Regulations, and Section 5.3 of the Site Plan Review Regulations outline various drainage and stormwater management provisions. Taken as a whole, these provisions provide a fairly reasonable and comprehensive framework for dealing with stormwater management concerns. However, the regulatory constraints are such that the drainage provisions of the Subdivision Regulations can only be applied to subdivision proposals, and the drainage provisions of the Site Plan Review Regulations can only be applied to site development proposals. There have been occasions where the drainage provisions of the Site Plan Review Regulations would have been of benefit to a subdivision proposal, and visa versa. The Planning Board should consolidate the various drainage provisions from both sets of regulations into a single stormwater management provision to be applied in both the subdivision and site plan review processes.

8. The wetland setbacks for septic systems as outlined in the Subdivision Regulations are inconsistent with the setback standards outlined in the Zoning Ordinance under the provisions of the Wetland Conservation District. In Section 4.3.1, Item b-3 of the Subdivision Regulations, septic systems must be located 75 feet from a poorly drained soil and 100 feet from a very poorly drained soil. In Section 11.5.3, Item a of the Zoning Ordinance, septic systems must be located 50 feet from a poorly drained soil and 75 feet from a very poorly drained soil. The Planning Board should amend Section 4.3.1, Item b-3 to reference the septic system setback standards of the Wetland Conservation District.

9. Section 4.3.1, Item b-1 of the Subdivision Regulations, which allows poorly drained soils to be used for as much as 25% of the minimum lot size, is inconsistent with Section 11.5.1 of the Wetland Conservation District (Section 11 of the Zoning Ordinance). Section 11.5.1 states that poorly drained soils may be used to fulfill the minimum lot size provided that a contiguous non-wetland area of 30,000 square feet is provided for each lot. Section 4.3.1, Item b-1 of the Subdivision Regulations should be amended to conform with Section 11.5.1 of the Wetland Conservation District.

10. It would be helpful to potential developers if the minimum contiguous non-wetland area requirement of the Wetland Conservation District (Section 11.5.1) were listed within the Table of Dimensional Requirements (Section 4.2). This would alert potential developers that a minimum contiguous non-wetland area of 30,000 square feet is required for all newly created lots.

11. The Wetland Conservation District (Section 11 of the Zoning Ordinance) should be amended to include Section 4.3.1, Item b-4 of the Subdivision Regulations which states that "There shall be no filling of wetlands for the purpose of providing the minimum distance between the wetlands and sewage disposal systems." This is a beneficial provision which should be included in the septic system setback standards of the Wetland Conservation District (Section 11.5.3, Item a).

12. The Town's Floodplain Management District (Section 17 of the Zoning Ordinance) should be amended in two instances. The current ordinance is in compliance with the standards of the National Flood Insurance Program (NFIP) as administered by the Federal Emergency Management Agency (FEMA), however, an additional provision dealing with variances has been suggested by the NH Office of Emergency Management. Also, FEMA has recently begun to advise New Hampshire communities to modify their floodplain ordinances to give distinction to recreational vehicles and their relationship to the NFIP. The NH Office of Emergency Management has prepared model language to address both the variance issue and the recreational vehicle issue. To obtain the model language, please contact the Rockingham Planning Commission or the NH Office of Emergency Management in Concord.

13. Within Section 4.4.11 of the Subdivision Regulations, there are several different standards which apply to several different sizes of septic systems. First of all, septic systems under 2,000 gallons per day (gpd) must be designed by a septic system designer licensed in New Hampshire, while septic systems over 2,000 gpd must be designed by a professional engineer practicing in New Hampshire. No mention is made of which standard applies to those systems designed for exactly 2,000 gpd. Section 4.4.11 goes on to state that the Planning Board may require a "groundwater mounding analysis" for septic systems designed for 2,400 gpd or greater. Lastly, Section 4.4.11 gives the Planning Board the power to require a hydrogeologic study for septic systems designed for 2,400 gpd.

    The above provisions were designed to give the Planning Board additional assurance that large septic systems would be designed and installed properly. However, the size limits of the various provisions are not only arbitrary, but are inconsistent with what the State considers as a "large disposal system". Since the State's administrative rules (Env-Ws 1002.21) defines large septic systems as those systems designed for 2,500 gpd or more, having local standards for septic systems designed for 2,000 and/or 2,400 gpd is inconsistent.

    In order to establish some consistency and clarity among the various provisions described above, several changes to Section 4.4.11 are recommended:

    -- Septic systems designed for 2,500 gpd or more should be designed by a septic system designer licensed in New Hampshire or a professional engineer licensed in New Hampshire. For septic systems under 2,500 gpd, home owners should be able to design the system for their own residence and, in all other cases, the system should be designed by a septic system designer licensed in New Hampshire. This provision is in full compliance with the administrative rules of the NH Water Supply and Pollution Control Division.

-- The Planning Board's power to require a "groundwater mounding analysis" should only apply to large disposal systems, defined by the State as those systems designed for 2,500 gpd or more.

-- The Planning Board's power to require a hydrogeologic study should only apply to large septic disposal systems designed for 2,500 gpd or more.

14. Section 4.4.11 of the Subdivision Regulations also gives the Planning Board the power to require a hydrogeologic study for projects located within a stratified glacial sand and gravel deposit (basically, the Town's aquifers) as identified by the NH State Geologist Office and depicted on a series surficial geology maps. This specific provision should be amended to reference the boundaries of the Town's Aquifer Protection District and its referenced scientific studies.

15. Section 4.4.11 of the Subdivision Regulations should be further amended to deal with the placement of septic systems on sloping areas. The following provision is suggested:

> Sloping Lots: Leaching fields may be constructed on sloping lots provided the natural grade of the proposed location does not exceed 15%. When the natural grade exceeds 5%, the WSPCD "50% rule" (ENV-Ws 1014.05) which allows up to 50% of the bed bottom to be less than four feet from the seasonal high water table may be used. However, the upgradient side of the bed bottom shall be at least three feet above the seasonal high water table.

16. There are numerous provisions within the Subdivision Regulations and Site Plan Review Regulations which reference municipal water and sewer systems, and the Town Engineer. Since Stratham does not have such services or a Town Engineer, it is suggested that these various provisions be amended to reference the applicable public water and sewer standards of the State, and the engineering consultant chosen by the Planning Board. Amending the regulations in this manner would bring them into closer conformity with reality and actual Planning Board practices.

Other Regulatory Considerations

The Town's existing environmental protection zoning (Wetland Conservation District, Shoreland Protection District, Aquifer Protection District and Floodplain Development Ordinance) is a prime example of an innovative land use control as authorized under RSA 674:21, as are the various options for cluster development. Other innovative land use controls were considered for Stratham, however, none seemed appropriate at this juncture.

Stratham currently has a Growth Management Ordinance in place (Section 14 of the Zoning Ordinance) as authorized under RSA 674:22. Other options for growth management and timing of development regulations and growth management/interim regulations (as authorized under 674:23) were considered for Stratham, however, none seemed appropriate at this time.

Municipalities in New Hampshire have the option of regulating the use of local water resources through their powers to make by-laws in accordance with RSA 31:39. No new by-laws are recommended at this time, however, the Town may need to look at the issue of ice fishing shacks along the frozen surface of the Squamscott River. Invariably, every year there are a couple shacks which go unretrieved, left to break apart and fall into the River. If the problem persists, the Town may want to consider establishing a policy to deal with the matter.

Stratham has the option of regulating the disposal of hazardous wastes through its power to make by-laws as authorized under RSA 31:39. Many of the problems associated with hazardous wastes are addressed within the framework of the Town's existing environmental protection districts; also, the recommended non-regulatory programs and regulatory changes should help to minimize the problems associated with hazardous waste disposal.

Cost Considerations

Generally, the financial cost of amending municipal ordinances and regulations is minimal. The major cost is in terms of time (night meetings, hearings, etc.). Technical assistance in the drafting and implementation of the proposed amendments can likely be handled by the Rockingham Planning Commission upon request. Some minor expenses would be incurred as a result of complying with the statutory requirements for the publication of hearing notices and the notification of abutters.

It should not be necessary for the Town to hire any additional personnel to prepare or oversee the recommended regulatory changes. Much of the work can be handled by the local municipal infrastructure already in place. Once again, the Rockingham Planning Commission would be available to provide technical assistance to the Town regarding any water resource protection effort.

Alternative Evidence

It should be noted that the information presented in this plan is designed for general planning purposes only, and not for site specific analysis. There may be discrepancies between the information presented in this plan and the actual conditions of a particular site in Stratham. It is therefore recommended that the governing bodies of Stratham implement a process for allowing applicants for required local approval to present documented scientific and technical information which differs from the information used to prepare this plan; specifically, the surface water, groundwater, and potential threats chapters.

In conjunction with a process for the submission of alternative scientific and technical evidence, a process must be established which enables local decision makers to consider such evidence. Both processes need to be in place. It is recommended that the applicant be allowed to submit alternative information, and the decision making body be allowed to consider such information, prior to and/or during the decision making process.

A process for both the submission and consideration of alternative scientific and technical evidence should be built into the procedures of the Planning Board, Board of Adjustment, Conservation Commission, or any other local governmental body having regulatory authority. Any local governmental body using the information presented in this plan during its decision making process should adopt procedures for both the submission and consideration of alternative scientific and technical evidence.

APPENDIX A

STRATHAM SOIL DESCRIPTIONS AND DEVELOPMENT POTENTIAL MATRIX

The following appendix describes the various soil types found within Stratham. Each individual soil type has been rated in terms of development capability according to the publication, Soil Potentials for Development: New Hampshire Seacoast Area, prepared by the Rockingham and Strafford County Conservation Districts in 1985.

Soil Symbol	Name	Description
26A	Windsor	loamy sand, 0-3% slopes
26B	Windsor	loamy sand, 3-8% slopes
26C	Windsor	loamy sand, 8-15% slopes
29A	Woodbridge	fine sandy loam, 0-3% slopes
29B	Woodbridge	fine sandy loam, 3-8% slopes
30A	Unadilla	very fine sandy loam, 0-3% slopes
30B	Unadilla	very fine sand loam, 3-8% slopes
32A	Boxford	silt loam, 0-3% slopes
32B	Boxford	silt loam, 3-8% slopes
32C	Boxford	silt loam, 8-15% slopes
33A	Scitico	silt loam, 0-5% slopes
38A	Eldridge	fine sandy loam, 0-3% slopes
38B	Eldridge	fine sandy loam, 3-8% slopes
42B	Canton	gravelly fine sandy loam, 3-8% slopes
42C	Canton	gravelly fine sandy loam, 8-15% slopes
43B	Canton	gravelly fine sandy loam, 3-8% slopes
43C	Canton	gravelly fine sandy loam, 8-15% slopes
62B	Charlton	fine sandy loam, 3-8% slopes
63B	Charlton	fine sandy loam, very stony, 3-8% slopes
63C	Charlton	fine sandy loam, very stony, 8-15% slope
66B	Paxton	fine sandy loam, 3-8% slopes
66C	Paxton	fine sandy loam, 8-15% slopes
66D	Paxton	fine sandy loam, 15-25% slopes
67B	Paxton	fine sandy loam, very stony, 3-8% slopes
67C	Paxton	fine sandy loam, very stony, 8-15% slopes
67D	Paxton	fine sandy loam, very stony, 15-25% slopes
67E	Paxton	fine sandy loam, very stony 25-35% slopes
97	Greenwood-Osipee	ponded
115	Scarboro	muck
125	Scarboro	muck, very stony
129B	Woodbridge	fine sandy loam, 3-8% slopes, very stony
129C	Woodbridge	fine sandy loam, 8-15% slopes, very stony
134	Maybid	silt loam

Soil Symbol	Name	Description
140B	Chatfield-Hollis-Canton	very stony, 3-8% slopes
140C	Chatfield-Hollis-Canton	very stony, 8-15% slopes
295	Greenwood	mucky peat
298	Pits	sand and gravel
299	Udorthents	smoothed
305	Lim-Pootatuck	
313A	Deerfield	fine sandy loam, 0-3% slopes
313B	Deerfield	fine sandy loam, 3-8% slopes
314A	Pipestone	0-5% slopes
395	Chocorua	mucky peat
397	Ipswich	mucky peat
446A	Scituate-Newfields	0-3% slopes
446B	Scituate-Newfileds	3-8% slopes
447A	Scituate-Newfields	very stony, 0-3% slopes
447B	Scituate-Newfields	very stony, 3-8% slopes
447C	Scituate-Newfields	very stony, 8-15% slopes
460B	Pennichuck	channery very fine sandy loam, 8-15% slopes
495	Ossipee	mucky peat
497	Pawcatuck	mucky peat
510A	Hoosic	gravelly fine sandy loam, 0-3% slopes
510B	Hoosic	gravelly fine sandy loam, 3-8% slopes
510C	Hoosic	gravelly fine sandy loam, 8-15% slopes
510D	Hoosic	gravely fine sandy loam, 15-35% slopes
531B	Scio	very fine sandy loam, 0-5% slopes
533	Raynham	silt loam
538A	Squamscott	fine sandy loam, 0-5% slopes
546A	Walpole	very fine sandy loam, 0-5% slopes
547A	Walpole	very fine sandy loam, very stony, 0-3% slopes
547B	Walpole	very fine sandy loam, very stony, 3-8% slope
597	Westbrook	mucky peat
656A	Ridgebury	very fine sandy loam, 0-5% slopes
657A	Ridgebury	very fine sandy loam, very stony, 0-3% slopes
657B	Ridgebury	very fine sandy loam, very stony, 3-8% slopes
699	Urban Land	variable, on-site investigation required
997	Ipswich	mucky peat, low salt

Soil Potential Ratings For Development

Soil Symbols	Septic Tank Absorption Field	Local Roads and Streets	Dwellings with Basements	Overall Development Rating
12A	M	VH	VH	H
12B	M	VH	VH	H
12C	M	H	H	M
12E	VL	VL	VL	VL
26A	H	VH	VH	VH
26B	H	VH	VH	VH
26C	M	H	H	H
26E	VL	VL	VL	VL
29A	M	H	VH	M
29B	M	H	VH	M
32A	L	H	VH	M
32B	L	H	H	M
32C	L	M	M	M
33A	VL	VL	M	VL
38A	M	H	VH	M
38B	M	H	VH	M
42B	VH	VH	VH	VH
42C	H	H	H	H
42D	M	L	L	M
43B	VH	H	VH	VH
43C	H	M	H	H
43E	VL	VL	VL	VL
44B	M	H	VH	H
44C	M	M	H	M
45B	M	H	VH	H
45C	M	M	H	M
45D	M	L	L	M
62B	VH	VH	VH	VH
62C	H	H	H	H
63B	VH	H	VH	VH
63C	H	M	H	H
63D	M	L	L	M
66B	M	H	VH	M
66C	M	M	H	M
66D	L	L	L	M
67B	M	H	VH	M
67C	M	M	H	M
67D	L	L	L	L
67E	VL	VL	VL	VL
97	VL	VL	VL	VL
115	VL	VL	VL	VL
125	VL	VL	VL	VL
129B	M	H	H	M
129C	L	M	M	M
134	VL	VL	VL	VL

Ratings: VH -- Very High
H -- High
M -- Medium
L -- Low
VL -- Very Low

Soil Potential Ratings For Development

Soil Symbols	Septic Tank Absorption Field	Local Roads and Streets	Dwellings with Basements	Overall Development Rating
140B	M	L	M	M
140C	L	L	M	L
140D	VL	VL	L	VL
141E	VL	VL	VL	VL
295	VL	VL	VL	VL
298	---------- too	variable -	not rated ----------	
299	" "	"	"	"
305	VL	VL	L	VL
313A	M	H	VH	M
313B	M	H	VH	M
314A	VL	VL	M	VL
343C	H	M	M	M
343D	VL	VL	VL	VL
395	VL	VL	VL	VL
397	VL	VL	VL	VL
446A	M	H	VH	H
446B	M	H	VH	H
447A	M	H	VH	M
447B	M	H	H	M
447C	M	M	M	M
460B	M	M	M	M
460C	L	L	M	M
495	VL	VL	VL	VL
497	VL	VL	VL	VL
510A	M	VH	VH	H
510B	M	VH	VH	H
510C	M	H	H	M
510D	L	L	L	L
531B	M	H	VH	M
533	VL	VL	M	VL
538A	VL	VL	M	VL
546A	VL	VL	M	VL
547A	VL	VL	M	VL
547B	VL	VL	M	VL
597	VL	VL	VL	VL
599	L	M	M	M
656A	VL	VL	M	VL
657A	VL	VL	M	VL
657B	VL	VL	M	VL
699	---------- too	variable -	not rated ----------	
799	H	M	H	H
997	VL	VL	VL	VL

Ratings: VH -- Very High
H -- High
M -- Medium
L -- Low
VL -- Very Low

USER'S GUIDE FOR WELL COMPLETION REPORT DATA SUMMARIES [rev. 5/11/90]

Attribute	Explanation	Data Type, Codes and Definitions	Data Entry Conventions	Item Number on Well Completion Report
WRB#	Water Resources Board I. D. number	Text 8	[3-digit numeric town code]-[4-digit sequence no.] town code must include leading zeros	
OPT#	Optional number for cross referencing	(Reserved)		
ELEV	Elevation	Real Number	in feet above sea level	
LAT	Latitude	Integer	6 digit number for degrees, minutes, and seconds with leading zeros included	
LONG	Longitude	Integer	6 digit number for degrees, minutes, and seconds with leading zeros included	
ROAD	Address of well location	Text 26	street name or reference point (consult "dictionary" for accepted abbreviations)	2
TOWN	Town in which well is located	Text 22	complete name of town (no abbreviations allowed)	2
MAP	Map page number as recorded on the town's tax map	Text 10	varies according to the coding system in use by a particular town; prefix BLK- indicates block number	2
PARCEL	Parcel identifier as recorded the town's tax map	Text 12	varies according to the coding system in use by a particular town	2
DCOMP	Date well was completed	Date	6-digit no. for year/month/day with leading zeros included	3

APPENDIX B

Attribute	Explanation	Data Type, Codes and Definitions	Data Entry Conventions	Item Number on Well Completion Report
USE	Proposed use of well	Text 1 0=other 1=domestic 2=small community water supply 3=municipal 4=commercial 5=industrial 6=agricultural 7=institutional 8=test/exploration 9=abandoned		4
RSN	Reason for constructing well	Text 1 0=other 1=new 2=replace existing 3=deepen existing 4=provide additional supply 5=monitoring (water level measurement or water quality sampling) 6=stratigraphic observation only		5
TYPE	Type of well	Text 1 0=other 1=drilled in bedrock 2=drilled in gravel 3=dug 4=auger hole (any uncased hole) 5=driven point 6=undifferentiated		6
TOTD	Total depth of well	Real number	in feet below land surface datum	7
BDKD	Depth to bedrock	Real number	in feet below land surface datum	8

APPENDIX B (continued)

Attribute	Explanation	Data Type, Codes and Definitions	Data Entry Conventions	Item Number on Well Completion Report
CASING	Total length of casing installed in well	Real number	in feet	9
YTM	Yield test method	Text 1 1=bailed 2=pumped 3=compressed air		11
YTD	Yield test duration	Real number	in hours	11
YTQ	Discharge	Real number	in gallons per minute	11
SWL	Static water level	Real number (0.=overflowing .1=at ground level)	in feet below land surface datum	12
DMEAS	Date static water level was measured	Date	6-digit no. for year/month/day with leading zeros included	12
WQ	Water quality information	Text 1 Y="Yes" Laboratory analysis performed Null value (-0-)="no" or not reported		13

APPENDIX B (cont.)

Attribute	Explanation	Data Type, Codes and Definitions	Data Entry Conventions	Item Number on Well Completion Report
OB	Type of overburden material	Text 16 0=exposed bedrock 1=sand 2=gravel 3=till 4=clay 5=mixed 6=other		15
		Codes are entered layer by layer in the sequence reported in the WELL LOG; successive layers are separated by a hyphen (for example, 12-4 indicates a sand and gravel layer overlying a clay layer; mixed is used if 1 through 4 are recorded on the same line; if "6" is used, an explanation is included as a comment under the attribute NOTE)		
PI	Pump information	(Reserved)		
QC	Subjective assessment of quality of reported information	Text 1 1=good 2=fair 3=poor		
NOTE	Special notes	Text 36 YL=yield log SN=screen information GP=gravel pack DD=drawdown measurements DL=detailed log CM=comments		
		"CM:" is used to explain any attribute coded as "other" [ie., CM:USE(0)=fire protection]		

APPENDIX B
(cont.)

THE FOLLOWING ADDITIONAL CONVENTIONS APPLY AS NOTED:

1) no periods are permitted to follow abbreviations within text fields, except in the case of NAME where a period is required after the first initial
2) any attribute coded as "other" must be explained by means of a comment under NOTE; however, the code for any attribute can be qualified using a comment expressed in the standard format CM:attribute(code)=explanation as illustrated above
3) the 2-character NOTE codes must always be given in the order listed above and separated by a single space whenever multiple codes are needed (ie. SN GP and not GP SN)

WATER WELL COMPLETION REPORT DATA FOR THE TOWN OF SUNAPEE

WRB#	ROAD	MAP	PARCEL	ELEV	DCOMP	USE	RSN	TYPE	TOTD	BDKD	CASING	YTM	YTD	YTQ	SWL	OVERBURDEN	QC	NOTE
225.0165					86/??/11	1	1	1	203.0	25.00	42.00	3	1.00	15.00	15.00	3	2	
225.0425	Allen Ln		Lot 17		91/07/19	1	1	1	385.0	40.00	60.00	3	1.00	10.00	15.00	124	2	
225.0093	2 Apple Way			460.0	84/10/08	1	1	1	260.0	10.00	148.00	3		30.00		1-2	2	
225.0406	5 Apple Way				98/02/15	1	1	1	280.0	80.00	136.00	3	0.50	7.50		14	2	
225.0142	Apple Way		23		86/01/20	1	1	1	200.0	40.00	84.00	3		5.00		2-4	2	
225.0147	Apple Way		20		86/01/18	1	1	1	260.0	115.00	148.00	3		6.00		2-4	2	
225.0030	Apple Way			160.0	84/09/17	1	1	1	260.0	100.00	126.00	3		20.00		3	3	
225.0358	Apple Way	2	396-11		89/02/24	1	1	1	300.0	157.00	172.00	3	1.00	15.00		124	2	YL
225.0226	Appleway				87/05/26	1	1	1	202.0	151.00	169.00	3	0.50	35.00		12-3	2	YL
225.0401	Barker Rd		Lot 5		90/04/27	1	1	1	140.0	24.00	34.00	3		20.00		4	2	
225.0184	Barker Rd		1N		86/10/23	1	1	1	280.0	5.00	20.00	3		25.00		4	2	
225.0262	Barker Rd				87/09/03	1	1	1	260.0	12.00	21.00	3		10.00		14	2	
225.0446	Barker Rd		Lot 1		92/10/01	1	1	1	180.0	50.00	68.00	3	0.50	10.00		14	2	
225.0411	Barker Rd		Lot 10		90/08/23	1	1	1	200.0	50.00	78.00	3	0.50	15.00		2-4	2	
225.0404	Barker Rd				90/02/21	1	1	1	140.0	38.00	61.00	3	0.50	29.00		14	2	
225.0239	Barker Rd		16		87/01/07	1	1	1	140.0	32.00	48.00	3		12.00		2	2	
225.0062	Barker Rd			60.0	85/07/11	1	1	1	90.0	15.00	21.00	3	0.50	15.00		2	3	
225.0432	Bartlett Rd		Lot 8		92/02/03	1	1	1	240.0	35.00	68.00	3	0.50	8.00		4	2	
225.0454	Bartlett Rd				92/09/03	1	1	1	240.0	60.00	85.00	3	0.50	25.00		4	2	
225.0427	Bartlett Rd		Lot 9		92/01/23	1	1	1	140.0	50.00	68.00	3	0.50	60.00		4	2	
225.0002	10 Benjamin Rd			70.0	84/04/10	1	1	1	220.0	6.00	33.00	3		75.00		3	3	
225.0003	11 Benjamin Rd			60.0	84/04/10	1	1	1	140.0	5.00	50.00	3		20.00		3	3	
225.0011	12 Benjamin Rd			60.0	84/05/09	1	1	1	120.0	10.00	30.00	3		25.00		12	2	
225.0009	15 Benjamin Rd			50.0	84/05/03	1	1	1	120.0	20.00	30.00	3		15.00		12	3	
225.0018	17 Benjamin Rd			50.0	84/06/07	1	1	1	160.0	11.00	30.00	3		8.00		3	2	
225.0010	7 Benjamin Rd			70.0	84/05/09	1	1	1	160.0	15.00	25.00	3		10.00		12	2	
225.0361	Benny Ln				89/02/20	1	1	1	342.0	76.00	85.00	3	1.25	3.00		12	3	
225.0405	Berry Ln		Lot 4		90/04/09	1	1	1	260.0	54.00	68.00	3	1.00	15.00		4-2	2	
225.0063	Brown Ave			100.0	85/05/16	1	1	1	100.0	6.00	23.00	3		10.00		2	1	
225.0364	0ff Bunker Hill & Heights Rd		Lot 1		89/05/10	1	1	1	465.0	47.00	60.00	3		50.00		12	2	
225.0363	Bunker Hill & Heights Rd		Lot 2		89/05/09	1	1	1	200.0	57.00	84.00	3		6.00		12	2	
225.0412	137 Bunker Hill Ave				90/08/22	1	2	1	260.0	50.00	68.00	3	0.50	60.00		2-4	2	
225.0007	off Bunker Hill Ave			80.0	84/05/02	1	1	1	320.0	6.00	21.00	3		8.00		1	2	
225.0215	Bunker Hill Ave				86/12/20	1	1	1	262.0	89.00	103.00	3	0.50	20.00		1	2	
225.0071	Bunker Hill Ave			120.0	84/10/15	1	1	1	230.0	21.00	62.00	3		10.00		2-1	1	
225.0010	Bunker Hill Ave			110.0	84/08/21	1	1	1	170.0		60.00	3		9.00			2	
225.0329	Bunker Hill Ave		138		88/09/22	1	1	1	260.0	40.00	60.00	3		8.00		2	3	
225.0344	Bunker Hill Ave		Lot 138		88/09/22	1	1	1	260.0	40.00	60.00	3		8.00		2-4	2	
225.0287	Bunker Hill Ave		97		87/10/28	1	1	1	260.0	30.00	72.00	3		45.00		2	2	
225.0414	151 Bunker Hill Rd				90/10/18	1	2	1	320.0	68.00	88.00	3	0.50	4.00		2	2	
225.0300	off Bunker Hill Rd				87/12/29	1	1	1	100.0	16.00	33.00	3		100.00		4	2	
225.0119	Bunker Hill Rd		97		85/11/20	1	1	1	100.0	25.00	49.00	3		10.00		12	2	
225.0446	Bunker Hill Rd		Lot 81		92/10/27	1	1	1	180.0	32.00	51.00	3	0.50	30.00		1	2	
225.0451	Bunker Hill Rd		Lot 31		92/08/10	1	1	1	220.0	45.00	68.00	3	0.50	60.00		12	2	
225.0444	Bunker Hill Rd		Lot 79		92/07/23	1	1	1	180.0	30.00	51.00	3	0.50	100.00		1	2	
225.0169	Butterfield Ln		23		86/09/22	1	1	1	300.0	55.00	72.00	3		15.00		4	2	
225.0214	Butterfield Ln		17		86/11/17	1	1	1	220.0	15.00	28.00	3		5.00		1-4	2	
225.0621	Chapman Rd			100.0	84/06/29	1	1	1	160.0	12.00	50.00	3		10.00		3	2	
225.0188	Chapman Rd		2		86/09/08	1	1	1	400.0	30.00	45.00	3		1.50		2	2	
225.0217	Coach Rd				87/02/05	1	1	1	142.0	10.00	21.00	3	1.00	6.00		1	2	
225.0116	Coach Rd		15		86/01/14	1	1	1	120.0	40.00	53.00	3		11.00		12-4	2	
225.0173	Coach Rd		12		86/08/22	1	1	1	200.0	30.00	42.00	3	1.00	5.00		14	2	
225.0118	Coach Rd		8		86/02/03	1	1	1	204.0	40.00	95.00	3	2.00	15.00	15.00	3	2	YL
225.0127	Coach Rd		12		86/04/28	1	1	1	225.0	60.00	74.00	3	1.00	10.00		2-4	2	YL
225.0263	Coach Rd		17		87/09/03	1	1	1	140.0	12.00	21.00	3		12.00		6	2	

APPENDIX B (cont.)

WELL	ROAD	MAP	PARCEL	ELEV	DCOMP	USE	RSV	TYPE	DPTH	BDRD	CASING	YTM	YLD	YTP	[illegible]	OVERBURDEN	[illegible]	NOTE
225.0181	Coach Rd				86/10/04	1	1	1	104.0	25.00	27.00	3	0.75	50.00		12	2	
225.0323	Coach Rd		Lot 3		88/06/01	1	1	1	200.0	15.00	28.00	3		60.00		3	2	
225.0123	Coach Rd		14		86/04/28	1	1	1	120.0	32.00	42.00	3	1.50	50.00		2	2	
225.0172	Coach Rd		6		86/08/22	1	1	1	142.0	52.00	63.00	3	1.25	5.00		3	2	
225.0223	Coach Rd				87/05/18	1	1	1	282.0	47.00	63.00	3	0.50	25.00		13	2	
225.0343	Coach Rd		Lot 13		88/06/01	1	1	1	140.0	25.00	60.00	3		9.00		4	2	
225.0130	Coach Rd				86/04/23	1	1	1	200.0	28.00	40.00	3		6.00		3	2	
225.0178	Coach Rd		2		86/07/25	1	1	1	185.0	15.00	21.00	3	1.00	10.00		1-14	2	
225.0146	Coach Rd		4		86/04/28	1	1	1	300.0	40.00	50.00	3	1.00	5.00		1-2-4	2	YL
225.0280	off Coach Rd Humes Ct		4		87/10/14	1	1	1	180.0	15.00	26.00	3		30.00		2	2	
225.0281	off Coach Rd Humes Ct		2		87/10/14	1	1	1	140.0	30.00	65.00	3		15.00		3	2	
225.0245	Country Farm Est		4		87/07/13	1	1	1	125.0	45.00	60.00	3	1.00	30.00	15.00	2	3	
225.0326	Country Farm Est		Lot 22		88/07/01	1	1	1	160.0	45.00	63.00	3		15.00		4	2	
225.0382	Country Farm Est		Lot 14		89/10/10	1	1	1	160.0	46.00	68.00	3		40.00		4	2	
225.0397	Country Farm Est		Lot 19		89/12/28	1	1	1	140.0	40.00	68.00	3		20.00		34	2	
225.0381	Country Farm Est		Lot 8		89/10/06	1	1	1	180.0	46.00	68.00	3		60.00		4	2	
225.0244	Country Farm Est		11		87/07/13	1	1	1	145.0	30.00	40.00	3	1.00	8.00	15.00	2	3	
225.0399	Country Farm Rd				90/03/06	1	1	1	142.0	39.00	49.00	3	0.33	15.00		3	2	
225.0400	Country Farm Rd		Lot 17		90/03/08	1	1	1	142.0	28.00	40.00	3	0.50	30.00		3	2	
225.0430	Country Farm Rd		Lot 15		92/01/13	1	1	1	220.0	32.00	51.00	3	0.50	15.00		14	2	
225.0453	Country Farm Subdiv		Lot 18		92/07/28	1	1	1	220.0	45.00	68.00	3	0.50	40.00		3	2	
225.0282	County Farm Est		16		87/11/10	1	1	1	200.0	70.00	83.00	3		25.00		4	2	
225.0233	County Farm Est				87/04/17	1	1	1	120.0	30.00	48.00	3		10.00		3	2	
225.0388	County Farm Est		Lot 26		89/10/03	1	1	1	200.0	48.00	68.00	3		10.00		14	2	
225.0375	County Farm Est		Lot 10		89/08/08	1	1	1	145.0	65.00	83.00	3		20.00		14	2	
225.0220	County Farm Est				87/03/25	1	1	1	182.0	44.00	60.00	3	1.00	6.00		1	2	
225.0180	Crest View Ter				86/10/12	1	1	1	142.0	12.00	21.00	3	1.00	60.00	5.00	12	2	
225.0272	Crestview Rd				87/05/11	1	1	1	200.0	14.00	25.00	3	1.00	20.00		124	1	YL
225.0104	Crestview Terr		46		85/12/07	1	1	1	102.0	11.00	21.00	3	0.50	40.00		2	2	
225.0017	Depot & Dunbarton Oaks			60.0	84/05/25		1	1	120.0	0.00	21.00	3		10.00		2	2	
225.0053	off Depot Rd			100.0	85/01/14	1	1	1	505.0	5.00	27.00	3		30.00		6	1	CM:08(6)=shale
225.0052	off Depot Rd			100.0	85/01/10	1	1	1	300.0	5.00	23.00	3		30.00		6	1	CM:08(6)=shale
225.0054	off Depot Rd			100.0	85/03/04	1	1	1	300.0	5.00	27.00	3		25.00		3	1	
225.0175	Depot Rd		19		86/09/15	1	1	1	162.0	12.00	21.00	3	1.25	7.00		124	2	
225.0115	Depot Rd				86/01/10	1	1	1	140.0	18.00	31.00	3		10.00		2	2	
225.0043	Depot Rd				85/10/15	1	1	1	100.0	14.00		3		40.00		2	2	
225.0045	Depot Rd			120.0	85/07/17	1	1	1	150.0	15.00	21.00	3	1.50	6.00		2	2	
225.0044	Depot Rd			160.0	84/10/18	1	1	1	205.0	4.00	21.00	3		4.00		1	2	
225.0198	Depot Rd				86/10/09	1	1	1	240.0	15.00	25.00	3		5.00		3	2	
225.0046	Depot Rd			80.0	84/10/04	1	1	1	140.0	16.00	31.00	3		50.00		2	1	
225.0174	Depot Rd		21		86/08/05	1	1	1	200.0	20.00	40.00	3	1.00	15.00		4	2	YL
225.0237	Depot Rd & Dunbarton Oaks		38		87/01/06	1	1	1	100.0	18.00	31.00	3		100.00		1	2	
225.0238	Depot Rd & Dunbarton Oaks				87/01/06	1	1	1	100.0	50.00	64.00	3		100.00		1	2	
225.0437	30 Doe Run Ln				92/04/21	1	2	1	300.0	65.00	85.00	3	0.50	5.00		4	2	
225.0313	Doe Run Ln				88/04/21	1	1	1	140.0	12.00	26.00	3		50.00		1	2	
225.0168	Doe Run Ln		28		86/06/20	1	1	1	100.0	50.00	63.00	3		100.00		1-4	2	
225.0124	Doe Run Ln		62		86/02/12	1	1	1	100.0	50.00	60.00	3	0.25	25.00	20.00	3-4	2	
225.0418	Doe Run Ln		Lot 28		90/12/20	1	1	1	300.0	22.00	42.00	3	0.25	4.00	2.00	1	2	
225.0126	Doe Run Ln		1		86/02/13	1	1	1	150.0	55.00	70.00	3	0.25	12.00	20.00	1-4	2	
225.0321	Drury Plains		Lot 8		87/09/16	1	1	1	125.0	87.00	100.00	3	1.00	10.00	20.00	4	3	
225.0157	Drury Plain Rd				86/08/05	1	1	1	180.0	30.00	67.00	3		7.50		1	2	
225.0450	Drury Plains Rd		Lot 7		92/08/20	1	1	1	340.0	80.00	102.00	3	0.50	12.00		12	2	
225.0228	Drury Plains Rd		10		87/05/26	1	1	1	140.0	70.00	90.00	3		25.00		34	2	
225.0129	Drury Rd		5		86/04/30	1	1	1	180.0	80.00	90.00	3		60.00		1	2	
225.0345	Dunbarnton Oaks		Lot 31		88/10/03	1	1	1	180.0	21.00	40.00	3		7.00		4	2	
225.0022	21 Dunbarton Oaks			50.0	84/07/06	1	1	1	80.0	15.00	30.00	3		20.00		4-1	2	
225.0049	22 Dunbarton Oaks			30.0	84/11/14	1	1	1	180.0	15.00	24.00	3		20.00		1	1	
225.0050	23 Dunbarton Oaks			40.0	84/11/13	1	1	1	120.0	20.00	30.00	3		15.00		1	1	

APPENDIX B (cont.)

WRB#	ROAD	MAP	PARCEL	ELEV	DCOMP	USE	RSW	TYPE	TDTH	BDRO	CASING	YTY	YID	YTQ	$	OVERBURDEN	DC	NOTE
225.0051	29 Dunbarton Oaks			20.0	84/10/18	1	1	1	205.0	15.00	35.00	3		10.00		1	1	
225.0023	30 Dunbarton Oaks			30.0	84/07/06	1	1	1	120.0	15.00	30.00	3		10.00		1-4	2	
225.0047	34 Dunbarton Oaks			20.0	84/11/15	1	1	1	60.0	15.00	46.00	3		75.00		1	1	
225.0310	Dunbarton Oaks		Lot 32		88/05/11	1	1	1	140.0	40.00	63.00	3		20.00		4	2	
225.0231	Dunbarton Oaks		23		87/04/02	1	1	1	120.0	3.00	20.00	3		12.00		1	2	
225.0286	Dunbarton Oaks		20		87/10/27	1	1	1	200.0	8.50	30.00	3		10.00		24	2	
225.0346	Dunbarton Oaks				88/10/04	1	1	1	140.0	10.00	30.00	3		16.00		1-4	2	
225.0095	Dunbarton Oaks				85/09/04	1	1	1	175.0	23.00		3		60.00		1-4	2	
225.0316	Dunbarton Oaks		Lot 29		88/05/12	1	1	1	140.0	25.00	42.00	3		15.00			2	
225.0325	Dunbarton Oaks		Lot 26		88/05/24	1	1	1	175.0	5.00	26.00	3		60.00		4	2	
225.0108	Dunbarton Oaks		14		85/09/04	1	1	1	100.0	20.00	33.00	3		30.00		1-4	2	
225.0234	Dunbarton Oaks		28		87/04/01	1	1	1	100.0	3.00	20.00	3		10.00		1	2	
225.0048	Dunbarton Oaks				84/11/15	1	1	1	160.0	16.00		3		20.00		1	1	
225.0232	Dunbarton Oaks		27		87/04/14	1	1	1	100.0	6.00	20.00	3		30.00		6	2	CM:08(6)=fill
225.0339	Dunbarton Oaks		Lot 25		88/08/22	1	1	1	200.0	6.00	20.00	3		12.00		1	2	
225.0114	Dunbarton Oaks		39		85/12/10	1	1	1	100.0	30.00	52.00	3		10.00		1-4	2	
225.0285	Dunbarton Oaks		21		87/10/27	1	1	1	200.0	10.00	40.00	3		10.00		24	2	
225.0384	Dunbarton Oaks Dr				89/10/16	1	1	1	100.0	22.00	40.00	3		100.00		1-4	2	
225.0394	Dunbarton Oaks Rd		Lot 34		89/12/07	1	1	1	100.0	67.00	81.00	3		40.00		1-4	2	
225.0350	Dunbarton Oaks Rd		Lot 16		88/11/29	1	1	1	200.0	21.00	42.00	3		30.00		1	2	
225.0338	Dunbarton Oaks Rd		Lot 24		88/08/23	1	1	1	160.0	10.00	20.00	3		100.00		1	2	
225.0303	Dunbarton Oaks Rd				88/01/25	1	1	1	120.0	12.00	21.00	3		10.00		2	2	
225.0413	Dunbarton Oaks Subdiv		Lot 38		90/10/25	1	1	1	120.0	50.00	72.00	3	0.50	75.00		14	2	
225.0016	Eastbrook Devel				84/05/22	1	1	1	140.0	9.00		3		40.00		2	2	
225.0103	Eastbrook, Benjamin Rd				85/09/12	1	1	1	160.0	10.00		3		7.00		1	2	
225.0357	Elton Ave		Lot 2		88/09/21	1	1	1	250.0	105.00	120.00	3	1.00	15.00		5	2	
225.0128	2 Emery Ln				86/04/30	1	1	1	200.0	40.00	50.00	3		6.50		2	2	
225.0061	Evergreen Way			40.0	85/04/11	1	1	1	300.0	30.00	41.00		1.00		0.00	1	2	CM:high yield well
225.0148	Evergreen Way		10		86/07/12	1	1	1	297.0	15.00	41.00	3	1.00	12.00		3	2	YL
225.0359	French Ln		Lot 5		89/02/17	1	1	1	140.0	18.00	32.00	3		10.00		4	2	
225.0322	Frying Pan Ln				88/07/18	1	1	1	200.0	0.00	21.00	3		5.00		0	2	
225.0218	Frying Pan Ln				87/02/03	1	1	1	142.0	15.00	27.00	3	0.75	6.00		1	2	
225.0434	Gifford Farm		Lot 10		92/04/09	1	1	1	180.0	20.00	34.00	3	0.25	50.00		12	2	
225.0435	Gifford Farm Rd		Lot 13		92/04/15	1	1	1	220.0	50.00	68.00	3	0.25	50.00		12	2	
225.0448	Gifford Farm Rd				92/08/09	1	1	1	162.0	30.00	49.00	3	0.50	12.00		3	2	YL
225.0429	Gifford Farm Rd				91/10/12	1	1	1	245.0	40.00	50.00	3	1.00	8.00	24.00	2-4	2	
225.0442	Gifford Farm Rd		Lot 6		92/06/24	1	1	1	140.0	20.00	40.00	3	0.50	60.00		2	2	
225.0422	Gifford Farm Subdiv		Lot 12		91/05/07	1	1	1	160.0	18.00	51.00	3	0.50	10.00		2	2	
225.0365	Gifford Farms Rd		Lot 2		89/05/03	1	1	1	180.0	42.00	63.00	3		12.00		12	2	
225.0439	Gifford Farms Subdiv		Lot 22		92/05/01	1	1	1	180.0	35.00	51.00	3	0.50	30.00		12	2	
225.0356	Gilford Farm Rd		Lot 8		88/07/20	1	1	1	180.0	55.00	81.00	3	0.25	60.00		4	2	
225.0355	Gilford Farm Rd	24901	9		88/06/15	1	1	1	160.0	50.00	91.00	3	0.25	30.00		2-4	2	
225.0447	Goss Rd		Lot 8		92/09/25	1	1	1	322.0	16.00	25.00	3	1.50	30.00		3	2	YL
225.0219	Greenwood Commons		2		87/03/17	1	2	1	402.0	30.00	63.00	3	0.50	100.00		2	2	
225.0155	Guinea Rd		6		86/08/05	1	1	1	160.0	50.00	73.00	3		50.00		3-12	2	
225.0247	Guinea Rd				87/09/02	1	1	1	162.0	87.00	100.00	3	0.75	12.00		12	2	
225.0250	Guinea Rd		Lot 3		87/09/15	1	1	1	220.0	70.00	90.00	3		6.00		2	2	
225.0176	Height Rd		2		86/09/20	1	1	1	202.0	125.00	130.00	3	0.75	15.00		12	2	
225.0186	133R Heights Rd				86/07/11	1	1	1	123.0	25.00	42.00	3	1.00	25.00	0.10	3	2	
225.0006	Heights Rd			100.0	84/04/30	1	1	1	140.0	30.00	42.00	3		5.00		2-4	2	
225.0229	Heights Rd		40		87/05/19	1	1	1	180.0	100.00	120.00	3		7.50		3	2	
225.0421	Heights Rd				91/02/28	1	2	1	250.0	110.00	110.00	3	0.50	10.00	30.00	4	2	
225.0153	Heights Rd		2		86/07/28	1	1	1	240.0	105.00	160.00	3		7.00		4	2	
225.0087	Heights Rd			120.0	85/04/17	1	1	1	220.0	30.00	47.00	3		8.00		2-4	2	
225.0033	Heights Rd			120.0	84/12/08	1	1	1	201.0	50.00	65.00	3	1.00	75.00	25.00	2-4	1	YL
225.0091	Heights Rd				85/01/08	1	1	1	160.0	90.00		3		15.00		4	2	
225.0089	Heights Rd			120.0	85/05/31	1	1	1	240.0	50.00	64.00	3		12.00		2-4	2	
225.0154	Heights Rd				86/08/04	1	1	1	200.0	50.00	62.00	3		6.00		2	2	

APPENDIX B (cont.)

WRB#	ROAD	MAP	PARCEL	ELEV	DCOMP	DEF	PRM	TYPE	DPTH	ROKD	CASING	[illegible]	[illegible]	[illegible]		OVERBURDEN	[illegible]	NOTE
225.0090	Heights Rd			120.0	85/04/04	1	1	1	240.0	44.00	63.00	3		50.00		1-4	2	
225.0102	Heights Rd				85/09/16	1	1	1	200.0	36.00		3		5.50		12-4	2	
225.0094	Heights Rd			120.0	85/07/15	1	1	1	302.0	50.00	71.00	3	1.00	8.50		2-4	1	YL
225.0088	Heights Rd			160.0	85/01/15	1	1	1	140.0	20.00	53.00	3		5.00		3	1	
225.0222	Heights Rd	2208-0	15		87/04/29	1	1	1	500.0	25.00	40.00	3	1.00	8.00		124	2	
225.0100	Heights Rd				85/09/26	1	1	1	200.0	30.00		3		20.00		4	2	
225.0092	Heights Rd			120.0	85/06/26	1	1	1	200.0	35.00	52.00	3		5.00		2-4	2	
225.0098	Heights Rd & Bunker Hill				85/08/23	1	1	1	240.0	32.00		3		8.00		2	2	
225.0329	Hersey Ln			80.0	84/09/17	1	1	1	100.0	3.00	21.00	3		15.50		4	2	
225.0386	Hersey Ln		Lot 18		89/10/16	1	1	1	400.0	33.00	57.00	3		2.00		1	2	
225.0305	Hersey Ln Ext		Lot 8A		87/12/04	1	1	1	300.0	65.00	80.00	3	1.00	1.50		124	2	YL
225.0261	High Point Rd		Lot 4		87/06/24	1	1	1	200.0	75.00	101.00	3		12.00		12	2	
225.0292	96 High St				87/10/28	1	1	1	200.0	50.00	65.00	3	1.00	12.00		12	1	YL
225.0135	off High St		2		86/02/06	1	1	1	140.0	33.00	45.00	3		50.00		12-4	2	
225.0407	off High St		Lot 1		90/02/07	1	1	1	500.0	57.00	68.00	3	0.50	2.00		4	2	
225.0137	off High St				86/02/06	1	1	1	140.0	33.00	45.00	3		30.00		12-4	2	
225.0111	High St		14		85/11/27	1	1	1	100.0	12.00	28.00	3		10.00		12	2	
225.0195	High St				86/09/04	1	1	1	200.0	63.00	80.00	3		45.00		2	2	
225.0266	High St				87/07/10	1	1	1	220.0	60.00	70.00	3		12.00		12	2	
225.0330	High St		Lot 3		88/08/03	1	1	1	300.0	68.00	84.00	3		4.00		14	2	
225.0171	High St				86/09/01	1	1	1	180.0	30.00	42.00	3	1.50	6.00		34	2	
225.0249	High St		Lot 3		87/06/23	1	1	1	220.0	85.00	105.00	3		10.00		34	2	
225.0042	High St			120.0	85/06/19	1	1	1	160.0	35.00	47.00	3		10.00		2	1	
225.0331	High St				88/08/02	1	1	1	180.0	58.00	84.00	3		20.00		4	2	
225.0265	High St				87/07/10	1	1	1	260.0	62.00	80.00	3		25.00		2	2	
225.0335	High St				88/09/14	1	1	1	175.0	10.00	21.00	3		60.00		2	2	
225.0112	High St		15		85/11/27	1	1	1	120.0	12.00	26.00	3		6.00		12	2	
225.0182	High St				86/10/27	1	1	1	200.0	55.00	70.00	3		7.00		34	2	
225.0246	High St		28		87/07/10	1	1	1	265.0	70.00	80.00	3	1.00	15.00	3.00	3	3	
225.0295	High St		Lot 1		88/03/08	1	1	1	200.0	65.00	84.00	3		6.00			3	
225.0205	Highland Tidewater Rd		9		86/11/04	1	1	1	140.0	20.00	31.00	3		25.00		3	2	
225.0082	29 Holmgren Acres			120.0	85/03/04	1	1	1	140.0	30.00	42.00	3		8.00		2-4	1	
225.0101	Holmgren Acres				85/09/18	1	1	1	160.0	38.00		3		15.00		23	2	
225.0085	Holmgren Acres			100.0	85/05/03	1	1	1	360.0	1.00	42.00	3		4.00		2-4	2	
225.0081	Holmgren Acres			140.0	85/04/08	1	1	1	300.0	35.00	47.00	3		3.00		1-4	1	
225.0079	Holmgren Acres			120.0	84/11/13	1	1	1	80.0	30.00	42.00	3		50.00		2	1	
225.0097	Holmgren Acres				85/08/23	1	1	1	260.0	35.00		3		8.00		2	2	
225.0083	Holmgren Acres			120.0	84/11/13	1	1	1	120.0	25.00	45.00	3		7.00		1-2	1	
225.0084	Holmgren Acres			140.0	84/12/11	1	1	1	100.0	3.00	51.00	3		6.00		124	1	
225.0080	Holmgren Acres			120.0	85/04/04	1	1	1	320.0	19.00	42.00	3		1.50		1-4	1	
225.0026	Holmgren Acres			140.0		1		1	140.0	20.00	47.00	3		30.00		3	3	
225.0065	Holmgren Acres				85/01/14	1	1	1	80.0	10.00		3		50.00		1	1	
225.0187	Holmgren Farm Rd				86/09/08	1	1	1	260.0	38.00	46.00	3		60.00		1	2	
225.0167	Holmgren Rd		28		86/06/16	1	1	1	200.0	35.00	45.00	3		6.00		2-1	2	
225.0304	Humes Ct		Lot 10		87/11/17	1	1	1	140.0	20.00	42.00	3		20.00		2	2	
225.0296	Humes Ct		Lot 7		88/03/07	1	1	1	145.0	30.00	45.00	3	1.00	7.00	9.00	14	2	
225.0312	Humes Ct		Lot 11		88/05/13	1	1	1	140.0	25.00	42.00	3		100.00		14	2	
225.0308	Humes Ct		Lot 12		88/05/02	1	1	1	140.0	40.00	63.00	3		15.00		14	2	
225.0337	Humes Ct		Lot 13		88/09/08	1	1	1	250.0	45.00	62.00	3		12.00		24	2	
225.0299	Humes Ct		Lot 1		87/12/08	1	1	1	140.0	15.00	46.00	3		15.00		2	2	
225.0311	Humes Ct		Lot 5		88/05/13	1	1	1	100.0	19.00	42.00	3		15.00		4	2	
225.0327	Humes Ct		Lot 14		88/07/26	1	1	1	140.0	12.00	27.00	3		100.00		4	2	
225.0408	14 Humes Rd				90/03/02	1		1	260.0	40.00	60.00	3				2	3	
225.0351	Jewett Hill Portsmouth Ave				88/10/31	1	1	1	200.0	12.00	30.00	3		65.00		4	2	
225.0031	Kirriemuir Condos			80.0	84/09/14	1	1	1	140.0	13.00	23.00	3		30.00		2	2	
225.0415	Linda Ln				90/09/06	1	1	1	200.0	50.00	60.00			7.00		1-4	2	YL
225.0317	Long Hill		Lot 18		88/04/12	1	1	1	600.0	120.00	146.00	3		30.00		4	2	
225.0348	Long Hill Rd		Lot 17		88/12/20	1	1	1	200.0	125.00	147.00	3		10.00		14	2	

WRB#	ROAD	MAP	PARCEL	ELEV	DCOMP	USE	RSN	TYPE	TOTD	BDRD	CASING	MTH	YID	YTD	SWL	OVERBURDEN	QC	NOTE
225.0403	Longhill Rd		Lot 2		89/11/07	1	1	1	202.0	60.00	71.00	3	0.25	11.00		1	2	
225.0314	off Lovell Rd				88/04/19	7	1	1	140.0	26.00	45.00	3		60.00		2	2	
225.0315	off Lovell Rd				88/04/18	7	1	1	100.0	15.00	42.00	3		30.00		2	2	
225.0302	Lovell Rd				88/01/13	1	1	1	200.0	12.00	42.00	3		15.00		6	2	OK:06(6)=boulders
225.0243	Lovell Rd				87/04/02	1	1	1	180.0	32.00	42.00	3		20.00		2	2	
225.0284	Lovell Rd				87/10/26	1	1	1	260.0	15.00	30.00	3		4.00		2	2	
225.0121	Lovell Rd	74	3		85/08/12	1	1	1	300.0	60.00	101.00	3	0.33	1.00		24	2	
225.0417	Lovell Rd				90/11/30	1	1	1	220.0	40.00	63.00	3	0.75	4.00	21.00	4	2	
225.0301	Lovell Rd				88/01/12	1	1	1	260.0	12.00	39.00	3		15.00		12	2	
225.0333	2 Mark Ave				88/09/30	1	1	1	175.0	20.00	40.00	3		10.00		1	2	
225.0069	Meadow's Condo			120.0	84/12/10	1	1	1	260.0	30.00	63.00	3		10.00		2	2	
225.0065	Meadow's Condo			120.0	84/12/11	1	1	1	220.0	30.00	50.00	3		20.00		24	2	
225.0067	Meadow's Condo			120.0	85/04/09	1	1	1	180.0	42.00	50.00	3		15.00		2	1	
225.0064	Meadow's Condo			120.0	85/05/31	1	1	1	260.0	40.00	54.00	3		30.00		2	2	
225.0068	Meadow's Condo			120.0	85/04/09	1	1	1	160.0	42.00	50.00	3		20.00		2	1	
225.0066	Meadow's Condo			120.0	84/12/10	1	1	1	200.0	30.00	50.00	3				4	3	
225.0070	Meadow's Condo			120.0	84/12/07	1	1	1	160.0	40.00	63.00	3				2	3	
225.0332	Oak Ln		Lot 32		88/08/04	1	1	1	240.0	30.00	42.00	3		8.00		1	2	
225.0410	Oak Ln	3	9-6		90/06/24	1	1	1	260.0	30.00	40.00	3	0.50		12.00		3	
225.0409	Oak Ridge Rd		Lot 7		90/08/22	1	1	1	240.0	50.00	68.00	3	0.50	10.00		12-4	2	
225.0342	Oakridge Rd		Lot 5		88/08/01	1	1	1	200.0	30.00	42.00	3		10.00		12	2	
225.0341	Oakridge Rd		Lot 4		88/08/01	1	1	1	180.0	25.00	42.00	3		15.00		12	2	
225.0391	Oakridge Rd		LOt 11		89/10/30	1	1	1	140.0	17.00	31.00	3		60.00		2	2	
225.0370	Orchard Dr		Lot 21		89/07/20	1	1	1	160.0	49.00	68.00	3		25.00		4	2	
225.0443	Orchard Dr		Lot 8		92/07/24	1	1	1	360.0	60.00	85.00	3	0.50	8.00		1	2	
225.0362	Orchard Dr		Lot 1		89/04/18	1	1	1	260.0	47.00	63.00	3		5.00		12	2	
225.0336	Orchard Dr		Lot 7		88/09/12	1	1	1	275.0	60.00	80.00	3		10.00		2-4	2	
225.0360	Orchard Dr		Lot 11		89/02/08	1	1	1	300.0	89.00	105.00	3		4.00		24	2	
225.0367	Orchard Dr		Lot 9		89/06/29	1	1	1	200.0	78.00	103.00	3		75.00		14	2	
225.0328	Orchard Hill Park		Lot 6		88/07/25	1	1	1	300.0	50.00	70.00	3		5.00		2-3	2	
225.0347	Orchard Park		Lot 12		88/10/05	1	1	1	180.0	55.00	70.00	3		30.00		4	2	
225.0390	13 Patriots Rd		Lot 3		89/09/12	1	1	1	225.0	6.00	21.00	3		6.00		124	2	
225.0014	Patriots Rd			60.0	84/05/17	1	1	1	320.0	12.00	21.00	3		3.00		4	2	
225.0028	Patriots Rd			60.0	84/08/14	1	1	1	400.0	3.00	21.00	3		3.00		3	2	
225.0438	Peartree Rd		Lot 4		92/04/28	1	1	1	120.0	38.00	51.00	3	0.50	10.00		4	2	
225.0334	Perth Dr		Lot 5		88/09/29	1	1	1	275.0	30.00	44.00	3		5.00		1	2	
225.0117	46 Pine Wood Dr				86/01/09	1	1	1	200.0	40.00	56.00	3	1.00	30.00		2-4-2	2	YL
225.0235	102 Portsmouth Ave				87/02/18	1	1	1	220.0	20.00	40.00	3		6.00		4-12	2	
225.0274	152 Portsmouth Ave	11	39		87/08/18	1	1	1	250.0	20.00	41.00	3	1.00	15.00		123	2	YL
225.0424	337 Portsmouth Ave				90/10/09	1	1	1	200.0	3.00	26.00					3	2	
225.0192	Portsmouth Ave				86/10/02	1	1	1	380.0	15.00	25.00	3		5.00		3	2	
225.0036	Portsmouth Ave			120.0	85/01/24	7	1	1	450.0	30.00	142.00	3	1.00	10.50		4	2	
225.0189	Portsmouth Ave				86/09/05	1	1	1	120.0	16.00	26.00	3		60.00		4	2	
225.0309	Portsmouth Ave				88/05/10	1	1	1	655.0	18.00	26.00	3		30.00		4	2	
225.0113	Portsmouth Ave		176		85/12/09	1	1	1	280.0	15.00	31.00	3		4.00		1	2	
225.0200	Portsmouth Ave				86/11/22	1	1	1	140.0	22.00	34.00	3		8.00		2	2	
225.0161	Portsmouth Ave		273		86/05/23	1	1	1	400.0	22.00	40.00	3		4.00		2	2	
225.0204	Portsmouth Ave				86/12/18	1	1	1	320.0	2.00	25.00	3		10.00		2	2	
225.0416	Portsmouth Ave				91/01/10	4	2	1	320.0	30.00	51.00	3	1.00	8.00		4	2	
225.0221	Portsmouth ave				86/10/29	1	1	1	205.0	28.00	60.00	3		18.00		3	2	YL
225.0191	Portsmouth Ave				86/10/02	1	1	1	300.0	15.00	30.00	3		7.00		3	2	
225.0452	Portsmouth Rd				92/07/29	1	1	1	300.0	15.00	119.00	3	0.50	20.00		4	2	
225.0125	Raeder Dr		2		86/02/14	1	1	1	160.0	35.00	50.00	3	0.25	10.00	20.00	4	2	
225.0433	Raeder Dr				92/04/01	1	1	1	220.0	50.00	68.00	3	0.50	20.00		24	2	
225.0241	Raider Dr		2		87/05/19	1	2	1	220.0	50.00	63.00	3	0.50	25.00	12.00	2	2	
225.0201	Raider Dr				86/09/06	1	1	1	105.0	25.00	40.00	3	0.50	30.00	6.00	3	2	
225.0426	River Rd		Lot 15		91/06/21	1	1	1	260.0	12.00	21.00	3	0.50	5.00		1	2	
225.0420	River Rd		Lot 6		90/10/11	1	1	1	320.0	18.00	34.00	3	0.50	20.00		14	2	

APPENDIX B (cont.)

[illegible]	ROAD	MAP	PARCEL	ELEV	OCCMP	USE	RSV	TYPE	TOTD	BOXD	CASING	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
225.0419	River Rd		Lot 7		90/11/19	1	1	1	180.0	11.00	34.00	3	0.50	12.00		24	2	
225.0179	River Rd				86/08/29	1	1	1	200.0	15.00	25.00	3		12.00		4	2	
225.0227	Rollins Farm		20		87/05/27	1	1	1	180.0	40.00	58.00	3		12.00		3	2	
225.0076	11 Rollins Farm Dr			100.0	85/06/28	1	1	1	140.0	30.00	58.00	3		15.00		2	2	
225.0072	Rollins Farm Dr				84/11/20	1	1	1	510.0	45.00		3		4.00		3	2	
225.0024	Rollins Farm Dr			100.0	84/07/20	1	1	1	140.0	6.00	52.00	3		5.00		2	2	
225.0074	Rollins Farm Dr				84/10/24	1	1	1	300.0	30.00		3		15.00		3	2	
225.0001	Rollins Farm Dr			120.0	84/03/13			1	180.0	30.00	60.00	3		10.00		3	3	
225.0078	Rollins Farm Dr			120.0	84/10/23	1	1	1	140.0	40.00	50.00	3		8.00		2-4	2	
225.0313	Rollins Farm Dr		Lot 22		88/04/12	1	1	1	140.0	85.00	103.00	3		75.00		14	2	
225.0077	Rollins Farm Dr			100.0	84/10/22	1	1	1	160.0	30.00	50.00	3		20.00		2-4	2	
225.0073	Rollins Farm Dr				84/10/29	1	1	1	200.0	30.00		3		15.00		1	2	
225.0025	Rollins Farm Dr			120.0	84/07/20	1	1	1	260.0	15.00	63.00	3		20.00			3	
225.0288	Rollins Farm Dr		26		87/10/28	1	1	1	240.0	40.00	65.00	3		6.00		3	2	
225.0099	Rollins Farm Dr				85/09/26	1	1	1	200.0	70.00		3		7.00		4	2	
225.0075	Rollins Farm Dr			120.0	84/10/24	1	1	1	120.0	25.00	45.00	3		5.00		2-4	2	
225.0027	Rollins Farm Dr			120.0	84/08/10	1	1	1	100.0	35.00	63.00	3		10.00		4	2	
225.0177	Rollins Farm Rd		23		86/07/24	1	1	1	165.0	90.00	95.00	3	1.00	20.00	25.00	1-34	2	
225.0340	Rollins Farm Rd		Lot 24		88/08/19	1	1	1	140.0	90.00	103.00	3		100.00		12	2	
225.0445	off Rte 101				92/06/04	1	1	1	185.0	10.00	20.00	3				2	2	
225.0040	Rte 101			60.0	85/01/29	1	1	1	160.0	8.00	21.00	3		25.00		6-4	2	CM:OB(6)=loam
225.0402	Rte 101				90/03/27	1	1	1	600.0	5.00	143.00	3		2.75		2	2	
225.0242	Rte 101				87/03/24	1	1	1	500.0	36.00	46.00	3		1.00		1-4	2	
225.0156	Rte 101				86/08/04	1	1	1	415.0	15.00	25.00	3		25.00		4	2	
225.0106	Rte 101				86/01/08	4	1	1	200.0	3.00	21.00	3		50.00			2	
225.0387	Rte 101				88/08/01	4	2	1	430.0	9.00	144.00	3	1.00	13.00		3	2	
225.0383	Rte 101				88/09/08	4	2	1	530.0	11.00	140.00	3	1.00	2.00		3	2	
225.0236	Rte 101				87/03/19	1	1	1	500.0	20.00	31.00	3		10.00		1-4	2	
225.0041	Rte 101			80.0	85/04/09	1	1	1	200.0	9.00	21.00	3		20.00		6	2	CM:OB(6)=fill
225.0105	Rte 101				86/01/07	4	1	1	200.0	3.00	21.00	3		45.00		0	2	
225.0380	Rte 101				88/08/04	4	2	1	530.0	10.00	141.00	3	1.00	1.00		3	2	
225.0012	Rte 101D Industrial Park			80.0	84/05/15	4	1	1	400.0	3.00	21.00	3		5.00		3	2	
225.0032	Rte 108			80.0	84/12/21	4	1	1	202.0	15.00	36.00	3	1.00	8.50		4	2	YL
225.0202	Rte 108		25		86/10/09	1	1	1	105.0	10.00	20.00	3	0.50	9.00	10.00	2	2	
225.0037	Rte 108				84/11/02	1	2	1	160.0	40.00		3	0.25	4.00		1-4	2	
225.0423	Rte 108				91/05/14	6	1	1	175.0	5.00	20.00	3	1.50	50.00	25.00	3	2	
225.0119	Rte 108		1		85/03/20	4	1	1	360.0	18.00	41.00	3	0.33	1.00		2	2	
225.0275	Russell Dr		Lot 4		87/08/17	1	1	1	150.0	55.00	81.00	3	1.00	40.00		12	1	YL
225.0216	Russell Dr		2		86/10/13	1	1	1	225.0	70.00	81.00	3	1.00	25.00	30.00	124	2	
225.0147	Russell Dr		1		86/07/30	1	1	1	250.0	50.00	67.00	3	1.00	10.00	20.00	2-3	2	YL
225.0349	Russell Rd				88/12/08	1	1	1	140.0	50.00	63.00	3		30.00		1	2	
225.0056	Sandy Point Rd			120.0	85/06/07	1	1	1	180.0	5.00	21.00	3		20.00		3	1	
225.0162	Sandy Point Rd				86/06/03	1	1	1	400.0	12.00	20.00	3		1.50		3	2	
225.0298	Sandy Point Rd		Lot 5		87/12/08	1	1	1	400.0	5.00	209.00	3		2.50		3	2	
225.0055	Sandy Point Rd			120.0	85/05/28	1	1	1	120.0	9.00	21.00	3		25.00		2	2	
225.0225	Sandy Point Rd				87/04/01	1	1	1	200.0	4.00	20.00	3		6.00		6	2	CM:OB(6)=fill
225.0096	cnr Sandy Pt & Depot Rd				85/10/29	1	1	1	500.0	15.00		3		1.25		2	2	
225.0213	cnr Sandy Pt & Depot Rd				86/11/04	1	1	1	100.0	30.00	51.00	3		10.00		3	2	
225.0271	Scammon Farms Rte 101				87/09/10	1	1	1	340.0	44.00	84.00	3		50.00		1-4	2	
225.0270	Scammon Farms Rte 101				87/09/11	1	1	1	445.0	38.00	69.00	3		20.00		1-4	2	
225.0138	Smith Farm Rd				86/01/24	1	1	1	220.0	11.00	26.00	3		7.00		4	2	
225.0395	Smith Farm Rd				89/12/12	1	1	1	122.0	22.00	40.00	3	0.75	11.00		3	2	
225.0139	Smith Farm Rd				86/01/24	1	1	1	140.0	11.00	27.00	3		20.00		4	2	
225.0373	Squamscott Rd				89/09/13	1	1	1	140.0	16.00	44.00	3		10.00		34	2	
225.0194	Squamscott Rd				86/10/02	1	1	1	860.0	38.00	52.00	3		30.00		4	2	
225.0193	Squamscott Rd		2		86/10/03	1	1	1	500.0	40.00	54.00	3		30.00		4	2	
225.0160	Stratham Cir & Rte 108				86/07/08	1	1	1	440.0	11.00	25.00	3		6.00		1	2	
225.0277	Stratham Heights Rd		Lot 9		87/07/29	1	1	1	323.0	20.00	52.00	3	1.00	50.00		4	2	

APPENDIX B (cont.)

	[illegible]	ROAD	MAP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	CASING	YTM	YTD	YTD	[illegible]	OVERBURDEN	DC	[illegible]
1																			
2	225.0293	Stratham Heights Rd		Lot 55		87/08/17	1	1	1	400.0	185.00	215.00	3	1.00	12.00		5	1	YL
3	225.0133	Stratham Heights Rd				86/03/20	1	1	1	360.0	39.00	60.00	3		2.50		2-4	2	
4	225.0306	Stratham Hgts Rd				87/12/11	1	1	1	275.0	45.00	60.00	3	1.00	3.00		124	1	YL
5	225.0428	Stratham Hgts Rd				91/11/18	1	2	1	285.0	55.00	63.00	3	1.00	10.00	18.00	2-4	2	
6	225.0190	Stratham Woods		21		86/09/05	1	1	1	140.0	30.00	40.00	3		10.00		4	2	
7	225.0196	Stratham Woods		2W		86/09/04	1	1	1	360.0	50.00	100.00	3		30.00		4	2	
8	225.0004	Stratham Woods			40.0	84/04/11	1	1	1	100.0	5.00	21.00	3		20.00		4	3	
9	225.0199	Stratham Woods		1E		86/09/03	1	1	1	620.0	55.00	100.00	3		20.00		4	2	
10	225.0230	Sweester Farm				87/05/20	1	1	1	200.0	5.00	20.00	3		60.00		4	2	
11	225.0208	Sweetland Way		3		86/01/24	1	1	1	230.0	78.00	90.00	3	2.00	30.00	6.00	14	2	
12	225.0212	Sweetland Way		7		86/06/09	1	1	1	205.0	45.00	60.00	3	2.00	30.00	5.00	1	2	
13	225.0206	Sweetland Way		1		86/08/29	1	1	1	405.0	50.00	64.00	3	2.00	2.00	30.00	14	1	YL
14	225.0210	Sweetland Way		5		86/01/31	1	1	1	255.0	69.00	82.00	3	2.00	35.00	10.00	14	2	
15	225.0211	Sweetland Way		6		86/06/05	1	1	1	230.0	37.00	50.00	3	2.00	10.00	8.00	14	2	
16	225.0207	Sweetland Way		2		86/01/27	1	1	1	255.0	58.00	72.00	3	2.00	3.00	15.00	14	2	
17	225.0209	Sweetland Way		4		86/08/30	1	1	1	155.0	36.00	50.00	3	2.00	24.00	5.00	14	1	YL
18	225.0122	Tall Pine Dr		4		85/09/03	1	1	1	120.0	30.00	48.00	3	0.17	8.00		1-2	2	
19	225.0291	Tall Pine Rd				87/11/12	1	1	1	142.0	27.00	40.00	3	0.50	20.00		12	2	
20	225.0008	6 Tall Pines Dr			100.0	84/05/03	1	1	1	120.0	20.00	42.00	3		30.00		2	2	
21	225.0020	Tall Pines Dr			100.0	84/06/13	1	1	1	120.0	30.00	42.00	3		50.00		2	2	
22	225.0005	Tall Pines Dr			100.0	84/04/30	1	1	1	120.0	20.00	30.00	3	0.25	10.00	10.00	1	2	
23	225.0034	Tall Pines Dr			100.0	84/04/10	1	1	1	120.0	18.00	41.00	3	0.17	20.00	12.00	1	2	
24	225.0035	Tall Pines Dr			120.0	84/08/01	1	1	1	240.0	21.00	51.00	3	0.17	6.00		1	2	
25	225.0013	Tall Pines Dr			100.0	84/05/15	1	1	1	105.0	25.00	40.00	3	0.25	20.00	10.00	1	2	
26	225.0019	Tall Pines Dr			100.0	84/06/13	1	1	1	120.0	30.00	42.00	3		20.00		2	2	
27	225.0170	Tide Water Rd		18		86/08/20	1	1	1	142.0	37.00	42.00	3	0.75	18.00		34	2	
28	225.0165	Tidewater Devel		7		86/06/12	1	1	1	140.0	15.00	20.00	3		20.00		3	2	
29	225.0164	Tidewater Devel		17		86/06/11	1	1	1	100.0	3.00	25.00	3		15.00		3	2	
30	225.0163	Tidewater Devel		8		86/06/11	1	1	1	80.0	3.00	25.00	3		50.00		3	2	
31	225.0385	Tidewater Farms Rd				89/09/27	1	1	1	220.0	11.00	28.00	3		4.00		34	2	
32	225.0398	Tidewater Farms Rd		Lot 5		89/12/07	1	1	1	140.0	15.00	27.00	3		8.00		3	2	
33	225.0431	Tidewater Farms Subdiv		Lot 4		91/09/11	1	1	1	180.0	17.00	34.00	3	0.50	20.00		14	2	
34	225.0436	Tidewater Farms Subdiv		Lot 13		92/04/15	1	1	1	220.0	25.00	51.00	3	0.50	20.00		4	2	
35	225.0203	Tidewater Rd		2		86/12/10	1	1	1	140.0	12.00	21.00	3		8.00		4	2	
36	225.0289	Tidewater Rd		1	40.0	86/12/14	1	1	1	202.0	15.00	20.00	3	0.75	7.00		1	2	
37	225.0290	Tidewater Rd			100.0	87/01/14	1	1	1	142.0	20.00	42.00	3	0.50	50.00		1	2	YL
38	225.0396	Tidewater Rd		Lot 16		89/12/18	1	1	1	140.0	15.00	34.00	3		20.00		14	2	
39	225.0226	Tidewater Rd		10		87/05/22	1	1	1	120.0	8.00	27.00	3		50.00		3	2	
40	225.0441	Tidewater Rd		Lot 26		92/06/25	1	1	1	300.0	30.00	51.00	3	0.50	5.00		24	2	
41	225.0134	Tidewater Rd		6		86/03/14	1	1	1	140.0	10.00	20.00	3		9.00		2	2	
42	225.0166	Tidewater Rd		9		86/06/16	1	1	1	100.0	9.00	21.00	3		25.00		2	2	
43	225.0319	Tidewater Rd		Lot 3		88/04/11	1	1	1	200.0	20.00	31.00	3		30.00		14	2	
44	225.0145	Traffic Circle				86/01/17	1	1	1	260.0	15.00	30.00	3		23.00		4	2	
45	225.0144	Traffic Circle				86/01/17	1	1	1	460.0	15.00	30.00	3		15.00		4	2	
46	225.0376	off Union Rd				89/08/15	1	1	1	420.0	55.00	84.00	3		100.00		14	2	CM:well #2 on lot
47	225.0377	off Union Rd				89/08/11	1	1	1	600.0	60.00	80.00	3		75.00		14	2	CM:well #1 on lot
48	225.0152	Union Rd	6	37-2		86/07/19	1	1	1	200.0	15.00	41.00	3	1.00	12.00		2	2	YL
49	225.0120	Union Rd		2		85/07/11	1	1	1	160.0	30.00	41.00	3	0.17	12.00		2	2	
50	225.0038	Union Rd			80.0	84/09/20	1	1	1	150.0		21.00	3		3.00			3	
51	225.0109	139 Walnut Ave				85/11/13	1	1	1	200.0	10.00	21.00	3		10.00		12	2	
52	225.0368	Walnut Ave		Lot 3		89/06/16	1	1	1	200.0	34.00	63.00	3		8.00		1-2	2	
53	225.0371	Walnut Ave		Lot 4		89/07/07	1	1	1	140.0	35.00	67.00	3		20.00		14	2	
54	225.0268	Walter Way		Lot 4		87/09/14	1	1	1	100.0	30.00	42.00	3		20.00		2	2	
55	225.0248	Walter Way		Lot 2		87/09/15	1	1	1	120.0	30.00	46.00	3		15.00		2	2	
56	225.0269	Walter Way		Lot 3		87/09/14	1	1	1	340.0	30.00	42.00	3		30.00		2	2	
57	225.0372	5 Wedgewood Dr		Lot 7		89/07/11	1	1	1	80.0	28.00	35.00	1	4.00	25.00	46.00	1-23-2	2	
58	225.0276	Wedgewood Dr				87/08/21	1	1	1	102.0	38.00	46.00	3	1.00	10.00		1	2	
59	225.0389	Wedgewood Dr		Lot 1		89/10/24	1	1	1	160.0	22.00	40.00	3		12.00		1	2	
60																			

APPENDIX B (cont.)

UPR#	ROAD	MAP	PARCEL	F DV	DCOMP	USE	ROW	TYPE	TOTL	BKRD	CAPCTY	YTR	YTP	YTC		[illegible]	OC	NOTE
225.0273	Wedgewood Dr		Lot 5		87/08/18	1	1	1	300.0	24.00	43.00	3	1.00	8.00		13	1	YL
225.0307	Wedgewood Dr		Lot 3		88/03/23	1	1	1	120.0	20.00	42.00	3		60.00		4	2	
225.0260	Wedgewood Rd		Lot 4		87/09/04	1	1	1	100.0	14.00	21.00	3		60.00		1	2	
225.0366	Whittaker Dr		Lot 4		89/07/20	1	1	1	200.0	69.00	85.00	3		20.00		4	2	
225.0158	Wiggins Farm				86/07/09	1	1	1	160.0	8.00	20.00	3		27.00		6	2	CM:08(6)=wetlands
225.0159	Wiggins Farm Rd				86/07/09	1	1	1	160.0	8.00	20.00	3		22.50		6	2	CM:08(6)=wetlands
225.0374	Wilkins Dr				89/09/07	1	1	1	240.0	60.00	85.00	3		30.00		4	2	
225.0379	William Cir				89/09/21	1	1	1	275.0	114.00	122.00	3	1.00	12.00		5	2	
225.0392	Williams Cir				90/01/10	1	1	1	220.0	120.00	136.00	3		30.00		4	2	
225.0378	Willow Brook				89/08/16	1	1	1	300.0	37.00	51.00	3		5.00		14	2	
225.0136	Willow Brook Ave		1		86/04/04	1	1	1	100.0	20.00	45.00	3		15.00		4	2	
225.0455	Willow Brook Rd				92/08/05	1	1	1	322.0	11.00	20.00	3	45.00	3.00		2	2	YL
225.0240	Willowbrook Ave				87/01/06	1	1	1	140.0	8.00	21.00	3		6.00		3	2	
225.0352	off Willowbrook Rd		Lot 2S		88/10/21	1	1	1	180.0	15.00	40.00	3		20.00		4	2	
225.0353	off Willowbrook Rd		Lot 1N		88/10/21	1	1	1	160.0	20.00	40.00	3		30.00		4	2	
225.0354	Willowbrook Rd		Lot 1		89/01/03	1	1	1	200.0	10.00	21.00	3		8.00		4	2	
225.0151	Winding Brook		6		86/07/11	1	1	1	475.0	28.00	41.00	3	1.00	5.00		1	2	YL
225.0447	Winding Brook		Lot 28		92/08/28	1	1	1	282.0	30.00	40.00	3	0.50	5.00		3	2	YL
225.0369	Winding Brook		29		89/07/19	1	1	1	360.0	20.00	34.00	3		3.50		1-4	2	
225.0150	Winding Brook		8		86/07/11	1	1	1	250.0	30.00	41.00	3	1.00	10.00		1-4	2	YL
225.0059	Winding Brook Dr			30.0	85/04/16	1	1	1	340.0	65.00	75.00	3		50.00		4	2	
225.0057	Winding Brook Dr			60.0	84/11/20	1	1	1	140.0	15.00	21.00	3		5.00		1	1	
225.0060	Winding Brook Dr			40.0	84/11/20	1	1	1	240.0	8.00	21.00	3		8.00		2	1	
225.0058	Winding Brook Dr			30.0	85/04/16	1	1	1	340.0	65.00	75.00	3		50.00		4	2	
225.0449	Winding Brook Rd		Lot 2		92/08/07	1	1	1	102.0	25.00	40.00	3	0.50	30.00	22.00	3	2	YL
225.0297	Winding Brook Rd		Lot 13		87/12/01	1	1	1	200.0	12.00	21.00	3		6.00		4	2	
225.0440	Winding Brook Rd		Lot 16		92/05/13	1	1	1	282.0	68.00	80.00	3	0.80	3.00		4	2	
225.0283	17 Winnicut Rd				87/11/03	1	1	1	140.0	25.00	41.00	3		50.00		12	2	
225.0278	off Winnicut Rd		Lot 6		87/08/29	1	1	1	225.0	40.00	53.00	3	1.00	4.00	7.00	34	2	
225.0279	off Winnicut Rd		Lot 9		87/08/28	1	1	1	165.0	30.00	47.00	3	1.00	5.00	9.00	4	2	
225.0264	Winnicut Rd				87/08/18	1	1	1	140.0	20.00	55.00	3		30.00		12	2	
225.0324	Winnicut Rd		Lot 24		88/05/31	1	1	1	100.0	18.00	42.00	3		50.00		2	2	
225.0267	Winnicut Rd				87/08/12	1	1	1	320.0	62.00	84.00	3		20.00		4	2	
225.0141	Winnicutt Rd		1		86/01/23	1	1	1	360.0	14.00	26.00	3		30.00		4	2	
225.0131	Winnicutt Rd		14		86/04/18	1	1	1	140.0	18.00	60.00	3		30.00		2	2	
225.0328	Winnicutt Rd		Lot 129		88/03/29	1	1	1	280.0	15.00	42.00	3		6.00		14	2	
225.0107	Winnicutt Rd				85/08/23	1	1	1	100.0	16.00	28.00	3		12.00		2	2	
225.0132	Winnicutt Rd		15		86/04/17	1	1	1	140.0	12.00	25.00	3		15.00		2	2	
225.0140	Winnicutt Rd		2		86/01/23	1	1	1	360.0	14.00	26.00	3		60.00		4	2	
225.0197		16	31		86/08/04	1	1	1	322.0	30.00	82.00	3	1.00	50.00		3	2	YL
225.0149			34		86/07/09	1	1	1	300.0	20.00	30.00	3	1.00	5.00		1	2	YL
225.0294					87/04/14	1	1	1	160.0	18.00	30.00	3	1.00	10.00		3	2	
225.0183			25		86/10/24	1	1	1	505.0	8.00	20.00	3		25.00		4	2	

COMPUTER CODES FOR PESTICIDE USAGE REPORTS

The following are codes for the TYPE of pesticide:

F = Fungicide
I = Insecticide
H = Herbicide
M = Miscellaneous

*NOTE: OIL has been recorded in gallons.

The following are codes for the CROP:

A = Apples
AF = Alfalfa
AFB = AirForce Base
AIR = Airport
AW = Aquatic Weeds
B = Blueberries
BEE = Beekeeper
BLK = Blackberries
C = Corn (Sweet)
CEM = Cemetery
CEXT = Cooperative Extension
CG = Campground
CH = Cherries
CRAN = Cranberries
CT = Christmas Trees
EST = Estate
EX = Extraneous Control
F = Fruit
FO = Forage
FOREST = Forest and Timber
FW = Flowers
G = Grapes
GC = Golf Course
GH = Greenhouse
GOURDS = Gourds
GOV = Government
H = Herbs
HOS = Hospital
INT = Interior Foliar
L = Lumber & Hardwood
LAWN = Lawn Care
LIVE = Livestock
M = Mosquito Control
MB = Mixed Berries
MUN = Municipal
N = Nursery
NC = Non-crop
O = Ornamentals
P = Pears
PE = Peaches
PEST = Pest Control
PH = Poultry House
PK = Park
PL = Plums
PND = Pond
POT = Potatoes
PU = Pumpkins
R = Raspberries
S = Strawberries
SILAGE = Silage Corn
SCH = School
SF = Small Fruit
SOD = SOD
SQ = Squash
T = Tomatoes
TF = Tree Fruit
V = Vegetables
WP = Wood Preserving

10/20/92

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CODENO.: 2694 - Winnicut Road TOWN: STRATHAM
FOR YEARS: 76 - 77 CROP: SILAGE ACRES: 40.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
ALACHLOR	H	124.0
ATRAZINE	H	124.0
DIPHACINONE	M	12.0

10/19/92

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CODENO.: 1087 - Bunker Hill Avenue TOWN: STRATHAM
FOR YEARS: 77-84,86-89 CROP: A/F/TF ACRES: 1.5

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PESTICIDE USED	TYPE	AMOUNT (LBS)
BENOMYL	F	1.3
CAPTAN	F	7.9
CARBARYL	I	0.8
PHOSMET	I	7.7

10/19/92

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CODENO.: 1499 - Squamscott Road TOWN: STRATHAM

FOR YEARS: 82,83,86-88 CROP: A/B ACRES: 2.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
CAPTAN	F	0.9
CARBARYL	I	0.4
GLYPHOSATE	H	13.1
MALATHION	I	0.6
METHIOCARB	I	0.7
PARAQUAT	H	0.6

10/19/92

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CODENO.: 1656 - Portsmouth Avenue TOWN: STRATHAM
FOR YEARS: 80-91 CROP: B/F/FW/R ACRES: 2.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
BENOMYL	F	17.6
CAPTAN	F	11.1
CARBARYL	I	9.0
DICHLOBENIL	H	1.6
DISULFOTON	I	0.9
MALATHION	I	62.3
METHIOCARB	I	8.1
TRIFORINE	F	6.9

10/19/92

CODENO.: 1770 - Bunker Hill Avenue TOWN: STRATHAM
FOR YEARS: 65-67,69-83 & 86 CROP: C/POT/S/V ACRES: 138.0

PESTICIDE USED	TYPE	AMOUNT (LBS)
2,4-D	H	202.0
ALACHLOR	H	300.0
ALDICARB	I	443.3
ATRAZINE	H	798.0
AZINPHOS-METHYL	I	335.0
BACILLUS THURINGIENSIS	I	234.2
BENEFIN	H	1.0
BUTYLATE	H	30.0
CAPTAN	F	27.5
CARBARYL	I	3652.5
CARBOFURAN	I	15.0
CHLORDIMEFORM	I	8.8
CHLOROBROMURON	H	50.0
CHLOROTHAL	H	9.0
CHLOROXURON	H	18.0
CHLORPROPHAM	H	77.0
CYANAZINE	H	32.0

10/19/92

CODENO.: 1770 - Bunker Hill Avenue TOWN: STRATHAM
FOR YEARS: 65-67,69-83 & 86 CROP: C/POT/S/V ACRES: 138.0

PESTICIDE USED	TYPE	AMOUNT (LBS)
DIAZINON	I	208.0
DINOSEB	H	1820.0
DIPHENAMID	H	50.0
DIQUAT	H	5.0
ENDOSULFAN	I	2913.5
EPTC	H	1465.0
FENVALERATE	I	17.5
GLYPHOSATE	H	45.0
LINURON	H	6.0
MALEIC HYDRAZIDE	M	315.0
MANCOZEB	F	1491.3
MANEB	F	4515.5
METHAMIDOPHOS	I	116.0
METHIOCARB	I	230.5
METHOMYL	I	165.6
METHYL PARATHION	I	270.0
METOBROMURON	H	40.0

PESTICIDE USAGE REPORT

10/19/92

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CODENO.: 1770 - Bunker Hill Avenue TOWN: STRATHAM
FOR YEARS: 65-67,69-83 & 86 CROP: C/POT/S/V ACRES: 138.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
METRIBUZIN	H	33.5
NAPROPAMIDE	H	19.0
PHENMEDIPHAM	H	4.5
PIRIMICARB	I	5.0
PYRAZON	H	5.0
TERBACIL	H	0.3
TETRACHLORVINPHOS	I	15.8
TRIFLURALIN	H	138.0

10/19/92

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CODENO.: 1869 - Squamscott Road, College Rd. TOWN: STRATHAM
FOR YEARS: 76-90 CROP: C/FO/SILAGE ACRES: 210.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
2,4-D	H	231.0
ALACHLOR	H	887.0
ATRAZINE	H	674.7
BUTYLATE	H	11.7
CYANAZINE	H	358.0
DICAMBA	H	33.0
EPTC	H	101.5
GLYPHOSATE	H	242.2
METOLACHLOR	H	359.3
PENDIMETHALIN	H	82.0

10/19/92

CODENO.: 1884 - Portsmouth Avenue TOWN: STRATHAM
FOR YEARS: 84-90 CROP: B/C/EX/F/POT/R/SQ/T/V ACRES: 23.0

PESTICIDE USED	TYPE	AMOUNT (LBS)
2,4-D	H	0.4
ATRAZINE	H	129.1
BACILLUS THURINGIENSIS	I	3.E-2 = 0.03
BENOMYL	F	1.0
BENSULIDE	H	13.4
CAPTAN	F	7.4
CARBARYL	I	0.8
CHLOROTHAL	H	28.9
CHLOROTHALONIL	F	23.0
CHLOROXURON	H	16.0
DIAZINON	I	11.9
DINOSEB	H	7.5
ENDOSULFAN	I	2.4
EPTC	H	1.9
ESFENVALERATE	I	3.6
GLYPHOSATE	H	7.9
METALAXYL	F	0.4

10/19/92

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CODENO.: 1884 - Portsmouth Avenue TOWN: STRATHAM

FOR YEARS: 84-90 CROP: B/C/EX/F/POT/R/SQ/T/V ACRES: 23.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
METHIOCARB	I	3.0
METHOMYL	I	50.5
METHOXYCHLOR	I	17.3
METHYL PARATHION	I	64.0
METOLACHLOR	H	203.3
NAPTALAM	H	2.8
PERMETHRIN	I	3.2
SIMAZINE	H	0.8
TRIFLURALIN	H	2.3

10/19/92

CODENO.: 1958 - High Street TOWN: CONWAY, GREENFIELD/STRATHAM
FOR YEARS: 66-85, 91 CROP: A/F/TF ACRES: 200.0

PESTICIDE USED	TYPE	AMOUNT (LBS)
2,4-D	H	18.0
ALACHLOR	H	170.0
AMS	H	830.0
ATRAZINE	H	44.0
AZINPHOS-METHYL	I	4129.0
BACILLUS THURINGIENSIS	I	38.0
BENOMYL	F	267.6
BENTAZON	H	4.0
BINAPACRYL	F	328.0
BUTYLATE	H	201.0
CAPTAN	F	5030.0
CARBARYL	I	1030.0
CARBOFURAN	I	8.0
CDEC	H	4.0
CHLORDANE	I	16.0
CHLORDIMEFORM	I	38.4
CHLOROPROPYLATE	I	80.0

10/19/92

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CODENO.: 1958 - High Street TOWN: CONWAY, GREENFIELD/STRATHAM
FOR YEARS: 66-85, 91 CROP: A/F/TF ACRES: 200.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
CHLOROTHAL	H	236.3
CHLOROXURON	H	12.0
CYANAZINE	H	275.2
CYHEXATIN	I	300.0
DAMINOZIDE	M	710.9
DDT	I	450.0
DEMETON	I	353.3
DICHLONE	F	350.7
DICOFOL	I	180.0
DIELDRIN	I	222.5
DINOSEB	H	795.0
DIPHACINONE	M	118.0
DODINE	F	1937.7
ENDOSULFAN	I	266.0
ETHEPHON	M	1.0
ETHION	I	33.5
FENVALERATE	I	0.3

10/19/92

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CODENO.: 1958 - High Street TOWN: CONWAY, GREENFIELD/STRATHAM
FOR YEARS: 66-85, 91 CROP: A/F/TF ACRES: 200.0

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PESTICIDE USED	TYPE	AMOUNT (LBS)
FERBAM	F	2798.3
GLYPHOSATE	H	20.0
LEAD ARSENATE	I	870.0
MANEB	F	5037.2
METHIOCARB	I	6.0
METHOMYL	I	109.3
METHYL PARATHION	I	368.8
METOLACHLOR	H	222.4
NAPROPAMIDE	H	28.0
OIL	I	2625.0
OXAMYL	I	60.0
PARAQUAT	H	18.0
PERMETHRIN	I	25.6
PHOSALONE	I	148.1
PHOSMET	I	3195.0
PHOSPHAMIDON	I	24.0
PROMALIN	M	0.5

10/19/92

****

CODENO.: 1958 - High Street TOWN: CONWAY, GREENFIELD/STRATHAM
FOR YEARS: 66-85, 91 CROP: A/F/TF ACRES: 200.0

****

PESTICIDE USED	TYPE	AMOUNT (LBS)
PROPARGITE	I	360.0
SIMAZINE	H	36.0
SULFUR	F	4301.3
TERBACIL	H	1.6
TETRACHLORVINPHOS	I	90.0
TETRADIFON	I	75.0
VORLEX	M	600.0
ZINC PHOSPHIDE	M	12.0
ZINEB	F	90.0

PESTICIDE USAGE REPORT APPENDIX C (cont.)

10/19/92

****

CODENO.: 2264 - Bunker Hill Avenue TOWN: STRATHAM
FOR YEARS: 87 & 90 CROP: A ACRES: 8.0

****

PESTICIDE USED	TYPE	AMOUNT (LBS)
CAPTAN	F	296.0
CARBARYL	I	33.0
DODINE	F	35.8
METHOMYL	I	7.2
PHOSMET	I	130.0

PESTICIDE USAGE REPORT

APPENDIX C (cont.)

10/19/92

****

CODENO.: 2819 - Frying Pan Lanw TOWN: STRATHAM

FOR YEARS: 75,76,78,81,82 & 90 CROP: SILAGE ACRES: 75.0

****

PESTICIDE USED	TYPE	AMOUNT (LBS)
ALACHLOR	H	376.0
ATRAZINE	H	420.1
METOLACHLOR	H	89.9

PESTICIDE USAGE REPORT

APPENDIX C (cont.)

10/20/92

****

CODENO.: 2825 - Depot Road TOWN: STRATHAM

FOR YEARS: 76 - 83 CROP: A/B/C/TF/V ACRES: 5.0

****

PESTICIDE USED	TYPE	AMOUNT (LBS)
2,4,5-T	H	4.0
2,4-D	H	8.0
AZINPHOS-METHYL	I	0.1
BENOMYL	F	1.3
CAPTAFOL	F	57.4
CAPTAN	F	4.3
CARBARYL	I	4.0
CHLORDANE	I	3.E-2=0.03
DIKAR	F	4.2
ENDOSULFAN	I	0.1
ETHYLAN	I	0.1
FERBAM	F	4.4
GLYODIN	F	1.2
GLYPHOSATE	H	6.5
MALATHION	I	6.6
MANEB	F	1.0
METHIOCARB	I	16.7

10/20/92

****

CODENO.: 2825 - Depot Road TOWN: STRATHAM
FOR YEARS: 76 - 83 CROP: A/B/C/TF/V ACRES: 5.0

****

PESTICIDE USED	TYPE	AMOUNT (LBS)
METHOXYCHLOR	I	14.6
OIL	I	0.5
PHOSALONE	I	0.5
PHOSMET	I	0.9
PROMALIN	M	1.E-2=0.01
SIMAZINE	H	0.8
TRIFORINE	F	4.0
ZINEB	F	1.7

APPENDIX D

FACILITIES REGULATED UNDER SARA

Establishment Name	Stratham Location	Type of Hazardous Materials	Volume Generated	Noted Physical and Health Hazards
Fiberglass Plus, Inc. **(site no longer active)**	Marin Way - Stratham Industrial Park	1) acetone - non-point air emission, 2) styrene - non-point air emission, 3) styrene - stack point air emission	1) 14,493 lbs. per year 2) 13,899 lbs. per year 3) 4,633 lbs. per year	all three are fire reactive
Charter Gas	9 Portsmouth Avenue	gasoline	three 10,000 gallon gas tanks	fire reactive and toxic
Hewlett-Packard Inc.	Marin Way - Stratham Industrial Park	freon, thinner 425, and flux 855	less than 250 gallons per month	all are fire reactive

STATE OF NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
RCRA GENERATOR LISTING

Inventory for the town of: STRATHAM

Generated August 11, 1992 at 3:47 PM

Generator Name	Street Location	Type
ANTIQUE REPAIR CO	23 PORTSMOUTH AVE	P
AUTO HOUSE OF EXETER	PORTSMOUTH AVE	P
AUTO HOUSE OF EXETER	PORTSMOUTH AVE	S
BELL & FLYNN INC	69 BUNKER HILL AVE	P
BERNSTEIN LAWRENCE	BROOKSIDE DR	P
CHARTER MARKETING CO	13 PORTSMOUTH AVE	P
CIRCLE K	13 PORTSMOUT AVE	P
COATING SYSTEMS INC	STRATHAM HIGHWAY SHED	P
DEAD RIVER OIL CO	313 PORTSMOUTH AVE	P
DOWN EAST ENERGY	39 PORTSMOUTH AVE	P
DOWN EAST ENERGY	39 PORTSMOUTH AVE	P
DOWN EAST ENERGY INC	39 PORTSMOUTH AVE	P
FIBERGLASS PLUS INC	STRATHAM IND PK	D
FIBERGLASS PLUS INC	STRATHAM IND PK	P
GILS JEEP EAGLE	ROUTE 101	D
GOFF LINCOLN MERCURY	PORTSMOUTH AVE	P
GOSS LINCOLN MERCURY ISUZU INC	RT 101 PORTSMOUTH AVE	D
HANNA L A & SONS INC	HEIGHTS & WALNUT AVE	P
HONDA BARN	34 PORTSMOUTHST	S
MACMILLIN CO	1 GIFORD FARM RD	P
NH VOC TECH COLLEGE	277 STRATHAM	P
NH VOCATIONAL TECHNICAL SCHOOL	227 R PORTSMOUTH AVE	D
NORMANDEAU ASSOCIATES INC	13 PORTSMOUTH AVE	P

STATE OF NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
RCRA GENERATOR LISTING

Inventory for the town of: STRATHAM

Generator Name	Street Location	Type
ROCKINGHAM COUNTY NEWSPAPERS	7 PORTSMOUTH AVE	D
ROCKINGHAM COUNTY NEWSPAPERS	7 PORTSMOUTH AVE	P
SKILLED AUTO SERVICE	29 PORTSMOUTH AVE	S
SLEEPERS REPAIR SERVICE	36 WINNICUT RD	D
SLEEPERS REPAIR SVC	36 WINNACUNENT RD	P
SQUAMSCOTT PRESS	62 PORTSMOUTH AVE	P
STRATHAM EURO CLEANERS	27 PORTSMOUTH AVE	D
STRATHAM EURO CLEANERS	27 PORTSMOUTH AVE	P
STRATHAM HILL BICYCLE INC	PO BOX 357	S
STRATHAM TIRE CO	17 PORTSMOUTH AVE	D
SULLIVAN TIRE	RT 101 PORTSMOUTH AVE	D

****
RCRA Generator Type Key
****

D = Permanent numbers assigned to facilities which routinely generate wastes.

P = Provisional - One time or emergency clean-up. Occasionally it is interim until a permanent number is obtained.

S = Safety Kleen - Self contained parts cleaner that is delivered and picked up on a regular basis

--- End of Report ---

APPENDIX E

Records of the Groundwater Protection Bureau

NH Dept. of Environmental Services Groundwater Protection Bureau
Listing of Sites for the Town of STRATHAM

Generated December 24, 1992 at 10:33 AM

Site#	Site Name	Site Address	Type	Quad#	Conf. Level
870575	ANTIQUE REPAIR CO.	23 PORTSMOUTH AVE	HAZWSTE/WM	185	1
870575	ANTIQUE REPAIR CO.	23 PORTSMOUTH AVE	UIC	185	1
920923	C & E SERVICE CENTER	39 PORTSMOUTH AVE.	LUST	000	
920318	CHARTER GAS STATION #2598	ROUTE 101/108, PORTSMOUTH AVE	LUST	185	1
900418	GIL'S JEEP EAGLE PEUGEOT	ROUTE 101 (50 PORTSMOUTH AVE)	HOLDTANK	169	1
890344	KING'S HIGHWAY PLAZA	PORTSMOUTH AVE	LUST	185	1
910504	LABBE'S BEAUTY SALON	255 PORTSMOUTH AVE	UIC	169	2
870631	LABONTE SUNOCO	PORTSMOUTH AVE	ODD	185	1
860506	MONTROSE CONDOMINIUMS	HERSEY LANE	SEPTIC	185	3
860506	MONTROSE CONDOMINIUMS	HERSEY LANE	SEPTIC	185	3
860506	MONTROSE CONDOMINIUMS	HERSEY LANE	SEPTIC	185	3
860506	MONTROSE CONDOMINIUMS	HERSEY LANE	SEPTIC	185	3
900730	SAEF LINCOLN MER/DBA GOSS LINCOLN MERCUR	ROUTE 101	LUST	185	2
920924	SHELL SERVICE STATION AND CARWASH	12 PORTSMOUTH AVE	HOLDTANK	000	
861001	SQUAMSCOTT ROAD CONDOMINUMS	SQUAMSCOTT ROAD	SEPTIC	000	
890816	STRATHAM CONDOS	RTE 108	SEPTIC	169	3
910701	STRATHAM HIGHWAY GARAGE	BUNKER HILL AVE	LUST	169	1
890904	STRATHAM LANDFILL	UNION RD	LAND/UNLN	169	1
910814	SULLIVAN TIRE	33 PORTSMOUTH ROAD	HOLDTANK	169	2
890464	WINNICUT VALLEY ESTATES	UNION RD	SEPTIC	000	

--- End of Report ---

APPENDIX F

ACTIVE UNDERGROUND STORAGE TANKS

This appendix identifies all known active underground storage tanks (USTs) within Stratham as of August 11, 1992. The inventory was provided by the Groundwater Protection Bureau of the NH Department of Environmental Services. As mentioned previously, the State requires that all USTs having a capacity of 1,100 gallons or more be registered, and the use reported to the NH Department of Environmental Services, under the NH Code of Administrative Rules WS 411.

The State's inventory was verified by Commission personnel in early 1993 with assistance from the Town's Administrative Assistant, Emergency Response Coordinator and local tank owners. Abandoned USTs are not included in the inventory. Although municipal officials believe there are numerous abandoned USTs scattered throughout Town, a comprehensive inventory has not been compiled at this time.

Information regarding storage tank leak detection systems and whether tanks are single or double walled was limited, and in many cases, unavailable. However, the requirements of WS 411 took effect in September 1985. Therefore, it is safe to assume that tanks installed after January 1986 are either doubled walled or have some type of secondary containment, and have some form of leak detection system.

This inventory provides information for those USTs in Stratham which have a capacity of close to 1,100 gallons or greater. The general locations of these tanks can be seen on the Potential Pollutant Sources Map (Map 9) which are found in the Description of Potential Threats chapter of this document. To find a particular UST site, please look at the site identification number listed in this appendix and then go to the Potential Pollutant Sources Map to identify its location.

APPENDIX F (cont.)

UNDERGROUND STORAGE TANKS

Site #	Site Owner	Site Location	Tank Size	Tank Const.	Date in Service	Mandatory Testing/ Removal Date	Product Stored
1	Bell & Flynn, Inc.	69 Bunker Hill Ave.	15,000 gallons	steel	1989	2014	diesel
2	Charter Gas	9 Ports. Avenue	10,000 gallons	steel	1977	2002	gasoline
			10,000 gallons	steel	1977	2002	gasoline
			10,000 gallons	steel	1977	2002	gasoline
3	King's Highway Plaza	28 Ports. Avenue	3,000 gallons	steel	1990	2015	fuel oil
4	L.A. Hanna & Sons, Inc.	313 Ports. Avenue	6,000 gallons	steel	1977	2002	diesel
			2,000 gallons	steel	1977	2002	gasoline
5	Stratham Tire	17 Ports. Avenue	1,000 gallons	steel	1973	1998	heating oil
6	NH Vocational - Technical College	Portsmouth Avenue	10,000 gallons	steel	1986	2011	#4 fuel oil
7	Stratham Highway Dept.	Bunker Hill Ave./ Union Road	2,000 gallons	steel	1992	2017	diesel
			2,000 gallons	steel	1981	2006	gasoline
8	Stratham Memorial School	39 Gifford Farm Road	10,000 gallons	steel	1988	2013	#2 fuel oil
9	Sullivan Tire	33 Ports. Avenue	500 gallons	steel	1986	2011	used oil
10	Stratham Fire Dept.	Winnicut Road	1,000 gallons	steel	1980	2005	fuel oil
11	Stratham Village Market	157 Ports. Avenue	4,000 gallons	steel	1979	2014	gasoline
			6,000 gallons	steel	1979	2014	gasoline
12	Stratham Municipal Center	Bunker Hill Avenue	10,000 gallons	steel	1984	2009	heating oil